52

MASTER

ONWI-23

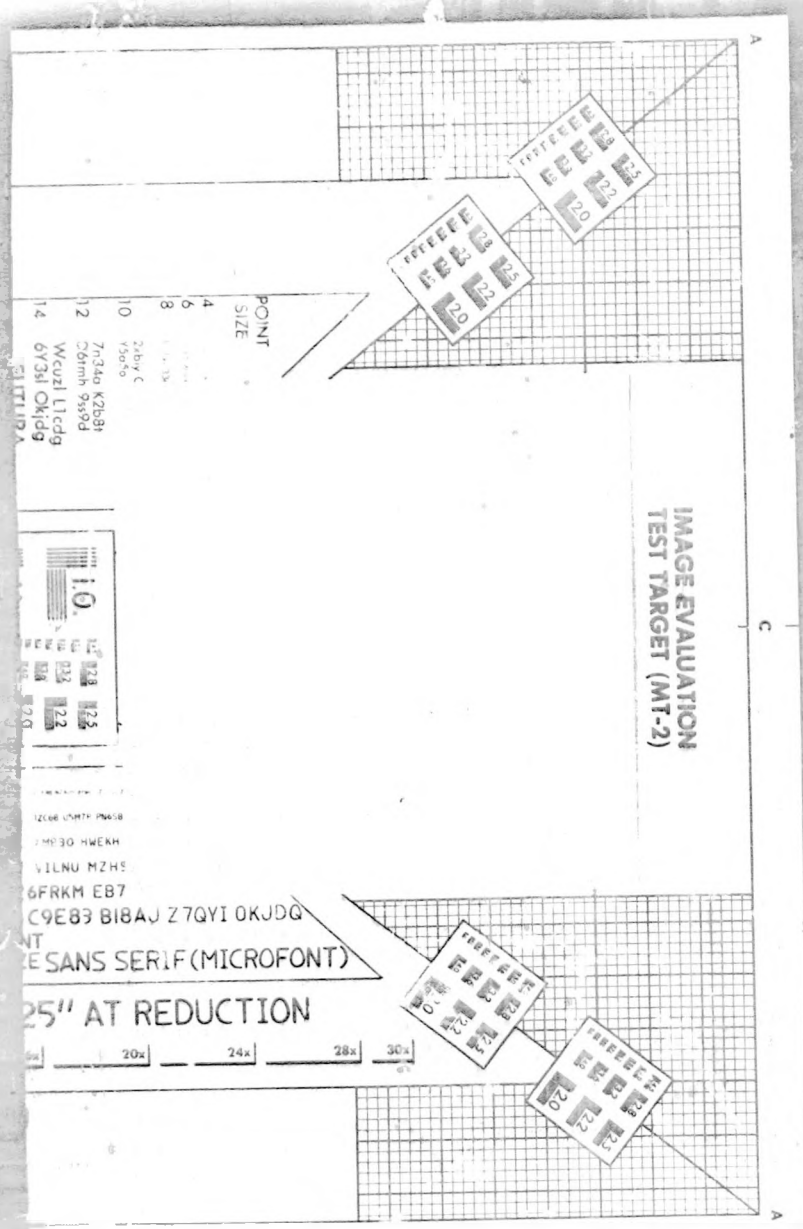
A Facsimile Report

Reproduced by

UNITED STATES DEPARTMENT OF ENERGY

Technical Information Center

P. O. Box 62 *Oak Ridge, TN 37830*



NOTICE

PORTIONS OF THIS REPORT ARE ILLEGIBLE.

It has been reproduced from the best available copy to permit the broadest possible availability.

MN ONLY

OFFICE OF NUCLEAR WASTE ISOLATION

ONWI 23

PRELIMINARY EVALUATION OF THE ENVIRONMENTAL ASPECTS OF POTENTIAL RADIOACTIVE WASTE REPOSITORY STUDY AREAS IN THE OHIO AND NEW YORK PORTIONS OF THE SALINA BASIN

September, 1979

BATTELLE MEMORIAL INSTITUTE
505 KING AVENUE
COLUMBUS, OHIO 43201

The information contained in this report was provided by NUS Corporation under subcontract E 512-01400 to ONWI and was administered by The Office of Nuclear Waste Isolation

PREPARED FOR THE
U. S. DEPARTMENT OF ENERGY
UNDER CONTRACT EY-76-C-06-1830

NOTE

Notice to the Reader:

The Department of Energy is evaluating various geographical regions and geological media in the United States to determine their potential suitability for deep geologic disposal of commercial radioactive wastes. The Office of Nuclear Waste Isolation (ONWI) of Battelle Memorial Institute is responsible to DOE for coordinating a number of subcontractors with geological and environmental expertise to this end. The evaluation program progresses from regional, to area, to location studies. Eventually, one or more repository sites may be selected from a number of potentially suitable locations.

This report is one of four reports being issued to describe the environmental and geologic investigations that have been completed in the Salina Basin.

At present, studies of the Salina Basin have been suspended and no further DOE/ONWI exploration activities will be initiated until appropriate consultation and concurrence with the Salina Basin states has occurred. The limited information in the Environmental Characterization report on Michigan salt areas reflects the absence of state concurrence to date for detailed characterization efforts.

The reports contained in the Salina series are:

Geologic Characterization	Report of Geologic Project Manager--Salina Basin, October, 1978, 2 vols., prepared by Stone & Webster Engineering Corporation (ONWI/SUB-E512-00600/1)
Environmental Characterization	Environmental Characterization of Bedded Salt Formation and Overlying Areas of the Salina Basin, September 1979 prepared by NUS Corporation (ONWI-16)
Environmental Summary	Preliminary Evaluation of the Environmental Aspects of Potential Radioactive Waste Repository Study Areas in the Ohio and New York Portions of the Salina Basin, September 1979, prepared by NUS Corporation (ONWI-23)
Regional Summary	Regional Summary and Recommended Study Areas for Ohio and New York Portions of the Salina Basin, September 1979, prepared by NUS Corporation (ONWI-29).

The Salina Basin characterization reports have received wide circulation and public comment as drafts. Modifications were made in these drafts as a result of comments and suggestions, as appropriate. This set of reports is being sent to you for your information; it describes the extent of progress to date on the characterization studies in the Salina Basin salt deposits.

The Salina Basin characterization efforts were performed during a period of changing national policy toward nuclear waste disposal. The national policy currently awaits final specification by the President. Technology development efforts, exploration, and evaluation of nonsalt media for repositories will be broadened and increased. In addition, the role of the individual states in reviewing the research program will be increased to include a concurrence role regarding studies of their respective areas.

Our records indicate that you may have an interest in this program and we are taking this opportunity to forward to you each of the four reports that characterize the region of the Salina Basin and identify areas that appear suitable for further study.

Sincerely,

J. O. Neff

Mr. J. O. Neff, Program Manager
U.S. Department of Energy
Columbus Program Office
Richland Operations Office

FOREWORD

The U.S. Department of Energy (DOE) has the responsibility to identify sites and construct and operate facilities for the storage or isolation of spent fuel and/or high level radioactive wastes from commercial operations of nuclear power plants. The National Waste Terminal Storage (NWTS) Program has been initiated by DOE to develop the technology and demonstrate the feasibility of burial and isolation of nuclear waste in deep geologic formations. A portion of this program is managed by the Office of Nuclear Waste Isolation (ONWI) of Battelle Memorial Institute, Columbus, Ohio.

The selection process for the identification of qualified site(s) for a waste repository will be an iterative one. Rock formations that could potentially support a waste repository will be evaluated in terms of environmental, geologic, and engineering properties. Those areas overlying rock units that appear most favorable will then be studied in greater detail to identify the most promising locations. Further studies will then be carried out at these locations to provide the environmental, geologic, and engineering data necessary and sufficient to qualify candidate sites. Sites proposed for waste repositories will be subject to Federal and state review and public hearing processes before a construction permit will be issued by the U.S. Nuclear Regulatory Commission (NRC).

Regional environmental and geological studies of the Salina basin have been completed. Results of the geological reconnaissance studies are contained in two reports by Stone & Webster Engineering Corporation and the regional environmental information is reported by the NUS Corporation; these reports are discussed and referenced in this document. An important end product of the geological studies is the recommendation that certain areas in northeastern Ohio and south central New York appear favorable for further study in the next phase of the program. In light of these results, ONWI requested NUS to evaluate the suggested study areas in relation to the environmental (non-geologic) information developed during the regional study, and to such other area data as readily available. The purpose of this report is two-fold: (1) it provides a preliminary environmental evaluation of the recommended study areas and (2) it provides a supplemental data source to the Salina basin regional report noted above.

To assure that these characterization activities are reasonably and adequately conducted, a continuous program of consultation and concurrence will be maintained with officials and agencies of each state. In this way, these activities will be influenced by the states and information collected and recommendations reached will reflect the needs and concerns of the states, and the NWTS program.

THIS PAGE

INTENTIONALLY

LEFT BLANK

TABLE OF CONTENTS

			Page
1.0	Introduction		1
	1.1	Overview of NWTS Program	1
	1.2	Purpose of Report	3
	1.3	Summary and Conclusions	3
2.0	Screening Process To Identify Areas For Further Study		6
	2.1	Areas of Geological Interest	6
	2.2	Environmental Screening Approach	6
3.0	Evaluation of the Northeastern Ohio Study Area		12
	3.1	Demography	12
		3.1.1 Population Centers and Urbanized Areas	12
		3.1.2 Population Density	12
	3.2	Socioeconomics	12
		3.2.1 Economic Base	17
		3.2.2 Mean Per Capita Income	17
	3.3	Land Use	17
		3.3.1 Recreational, Natural, Archaeological and Historical Areas	17
		3.3.2 Potentially Interactive Uses	17
	3.4	Transportation Systems	29
		3.4.1 Highways	29
		3.4.2 Railroads	29
	3.5	Indian Reservations	29
	3.6	Land Use Patterns	32
	3.7	Surface Water Resources	32
	3.8	Ground Water Resources	32
	3.9	Preliminary Environmental Assessment	32
4.0	Evaluation of New York Study Area 1		36
	4.1	Demography	36
		4.1.1 Population Centers and Urbanized Areas	36
		4.1.2 Population Density	36
	4.2	Socioeconomics	36
		4.2.1 Economic Base	36
		4.2.2 Mean Per Capita Income	40
	4.3	Land Use	40
		4.3.1 Recreational, Natural, Archaeological and Historical Areas	40
		4.3.2 Potentially Interactive Uses	40
	4.4	Transportation Systems	48
		4.4.1 Highways	48
		4.4.2 Railroads	48
		4.4.3 Navigable Waterways	48
	4.5	Indian Reservations	48
	4.6	Land Use Patterns	48
	4.7	Surface Water Resources	51
	4.8	Ground Water Resources	51
	4.9	Preliminary Environmental Assessment	51
5.0	Evaluation of New York Study Area 2		55
	5.1	Demography	55
		5.1.1 Population Centers and Urbanized Areas	55
		5.1.2 Population Density	55

TABLE OF CONTENTS (Continued)

			Page
	5.2	Socioeconomics	55
		5.2.1 Economic Base	55
		5.2.2 Mean Per Capita Income	61
	5.3	Land Use	61
		5.3.1 Recreational, Natural, Archaeological, and Historical Areas	61
		5.3.2 Potentially Interactive Uses	61
	5.4	Transportation Systems	66
		5.4.1 Highways	66
		5.4.2 Railroads	66
	5.5	Indian Reservations	66
	5.6	Land Use Patterns	66
	5.7	Surface Water Resources	71
	5.8	Ground Water Resources	71
	5.9	Preliminary Environmental Assessment	71
6.0	Supplemental Data for Beaver Dams, New York Subarea		75
	6.1	Demography	75
		6.1.1 Population Density	75
	6.2	Socioeconomics	75
		6.2.1 Economic Base	75
		6.2.2 Income	75
	6.3	Land Use	75
		6.3.1 Recreational, Natural, Archaeological and Historical Areas	78
		6.3.2 Potentially Interactive Uses	78
	6.4	Transportation Systems	78
		6.4.1 Highways	78
		6.4.2 Railways	79
	6.5	Surface and Groundwater Resources	79
	6.6	Preliminary Environmental Assessment	79
7.0	List of References		80

LIST OF TABLES

Number	Title	Page
1	1975 Population Estimates and Population Densities by Counties and Subdivisions, Northeastern Ohio Study Area	14
2	Major Industry Employment for 5-County Northeastern Ohio Study Area	18
3	County Employees and Payroll By Major Industry for 1975, Northeastern Ohio Study Area	19
4	Estimated Per Capita Income, Northeastern Ohio Study Area	22
5	Public and Private Recreational Areas, Northeastern Ohio Study Area	24
6	1975 Population Estimates and Population Densities by Counties and Subdivisions, New York Study Area 1	39
7	Major Industry Employment for 3-County Study Area, New York Study Area 1	41
8	County Employees and Payroll By Major Industry for 1975, New York Study Area 1	42
9	1970 Income Characteristics, New York Study Area 1	44
10	Estimated Per Capita Income, New York Study Area 1	45
11	1975 Population Estimates and Population Densities by Counties and Subdivisions, New York Study Area 2	57
12	Major Industry Employment For 5-County New York Study Area 2	60
13	Estimated Per Capita Income, New York Study Area 2	62
14	Population Density for Beaver Dams Subarea	76
15	Employment Patterns for Chemung Subareas	77

LIST OF FIGURES

Number	Title	Follows Page
1.	Salt Basins Being Investigated for Terminal Storage of Radioactive Wastes	1
2.	Potential Areas Proposed for Further Exploration in the Salina Basin, New York and Ohio	3
3.	Identification of Study Region in Ohio	6
4.	Identification of Study Area in New York	6
5.	Areas Favorable for Further Exploration in Ohio Study Area	6
6.	Areas Favorable for Further Exploration in New York Study Area	6
	NORTHEASTERN OHIO STUDY AREA	
7.	Population Centers and Urbanized Areas - Northeastern Ohio Study Area	12
8.	Persons Per Square Mile by Subcounty Areas - Northeastern Ohio Study Area	15
9.	Recreational, Natural and Other Areas - Northeastern Ohio Study Area	25
10.	Historic Places and Archaeological Sites - Northeastern Ohio Study Area	25
11.	Potentially Interactive Uses - Northeastern Ohio Study Area	25
12.	Transportation Systems - Highways - Northeastern Ohio Study Area	29
13.	Transportation Systems - Railways - Northeastern Ohio Study Area	29
14.	Surface Water Drainage Features in Northeastern Ohio Study Area	32
15.	Groundwater Availability in Northeastern Ohio Study Area	32
16.	Northeastern Ohio Study Area Composite	32
	NEW YORK STUDY AREA 1	
17.	Population Centers and Urbanized Areas - New York Study Area 1	36

LIST OF FIGURES (Continued)

Number	Title	Follows Page
18.	Persons Per Square Mile by Subcounty Areas - New York Study Area 1	36
19.	Recreational, Natural and Other Areas - New York Study Area 1	45
20.	Potentially Interactive Uses - New York Study Area 1	45
21.	Transportation Systems - Highways - New York Study Area 1	48
22.	Transportation Systems - Railways, Waterways, New York Study Area 1	48
23.	Surface Water Drainage Features in South Central New York (Study Area 1)	51
24.	Ground Water Availability in South Central New York (Study Area 1)	51
25.	New York Study Area 1 Composite	51
	NEW YORK STUDY AREA 2	
26.	Population Centers and Urbanized Areas - New York Study Area 2	55
27.	Persons Per Square Mile by Subcounty Areas - New York Study Area 2	58
28.	Recreational, Natural and Other Areas - New York Study Area 2	63
29.	Historic Places and Archaeological Sites - New York Study Area 2	63
30.	Potentially Interactive Uses - New York Study Area 2	66
31.	Transportation Systems - Highways - New York Study Area 2	66
32.	Transportation Systems - Railways, Waterways - New York Study Area 2	66
33.	Land Use Patterns - New York Study Area 2	66

LIST OF FIGURES (Continued)

Number	Title	Follows Page
34.	Surface Water Drainage Features in South Central New York Study Area 2	71
35.	Groundwater Availability in South Central New York Study Area 2	71
36.	New York Study Area 2 Composite	71
	BEAVER DAMS, NEW YORK SUBAREA	
37.	Beaver Dams, New York Composite	79

1. INTRODUCTION

1.1 Overview of NWTS Program

The Office of Nuclear Waste Isolation (ONWI), Battelle Project Management Division, Columbus, Ohio under contract with the U.S. Department of Energy (DOE) is managing part of the National Waste Terminal Storage (NWTS) program. One of the objectives of this program is to develop terminal storage facilities for nuclear waste from commercial power-generating reactors. Although a number of concepts are under consideration by DOE, waste isolation in deep stable geologic formations is of prime interest in the present phase of the program.

Rock salt has been identified as one of the rock types of principal interest. The suitability of salt deposits as a geologic medium for waste disposal has been extensively studied for over 20 years and has been recommended by a number of groups, including the National Academy of Sciences-National Research Council. Studies are continuing. Evaluations to date indicate that a repository in salt can be designed to provide the required degree of waste isolation.[1] Salt deposits of interest include both those existing as dome-shaped formations in the Gulf Interior Region and those occurring as extensive horizontally bedded units in the Salina, Permian, and Paradox basins (Figure 1).

Technical studies planned to support decisions on potential repository sites in salt involve two complementary programs. First of all, geologic studies are being conducted to locate geologic environments with characteristics that are conducive to waste isolation — that is, a low waste transport potential in a geologic setting that will insure that all public health, safety, and engineering feasibility requirements are met. The second program involves a broad spectrum of environmental characterization studies to insure that natural and human values are being properly considered in accord with the National Environmental Policy Act (NEPA) of 1969.

Both programs have started with regional, formation-wide surveys. Current plans are to proceed to area-wide surveys (approximately 1,000 square miles in extent) and confirmatory location studies (about 30 square miles in size). The environmental studies are being directed at areas of geologic interest. Geologic and environmental data are to be evaluated together in the site-selection process and the environmental impact assessments required by NEPA.

Details of the site-characterization program planned by DOE and ONWI have been documented and distributed.[2,3] Environmental and geologic programs are being run as interdependent studies with continuing coordination and cross-feeding of results. This insures that the findings of either program are made available immediately to the other for possible redirection of their studies. Several regional characterization reports on the Salina basin pertinent to the material that follows have been prepared for this phase of the program.[4-6]

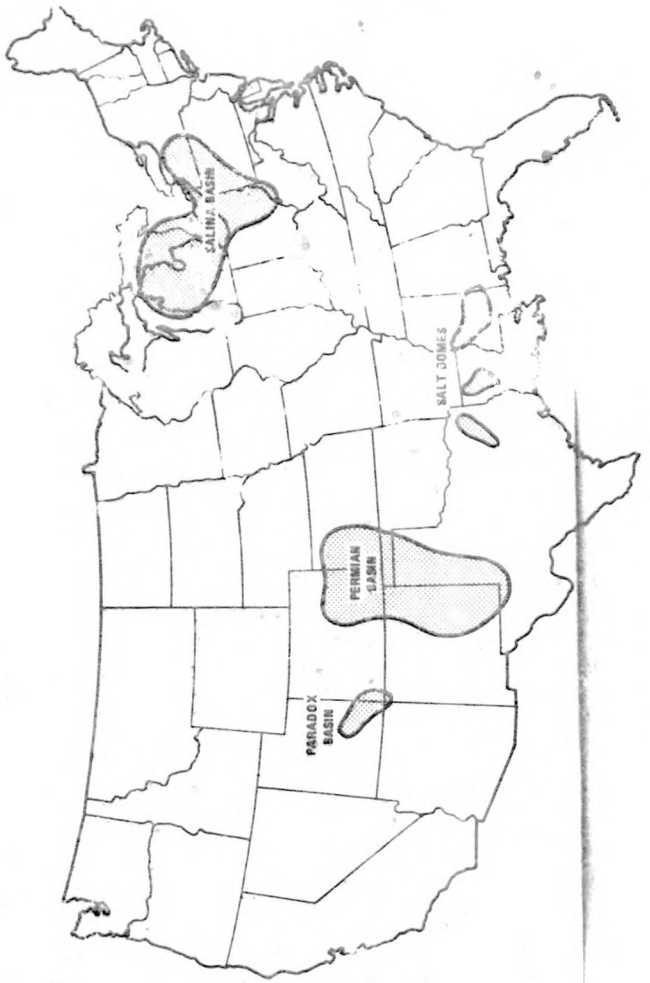


FIGURE 1 - SALT BASINS BEING INVESTIGATED FOR TERMINAL STORAGE OF RADIOACTIVE WASTES

1.2 Purpose of Report

Regional geologic reconnaissance of bedded-salt formations in the Salina basin, encompassing an area that extends over parts of the states of Michigan, New York, Pennsylvania, West Virginia and Ohio,[5] showed several subregions in New York and Ohio[6] as having salt deposits with features (depth to salt, salt thickness, minimum disturbance by man) preferentially favoring certain areas for further exploration (Figure 2).

The intent of these preliminary investigations is to examine the geologic and environmental aspects of potential storage areas before selecting any candidate areas for exploration. Area geologic studies will entail extensive and costly field studies for each area to be investigated; hence, management of a cost-effective exploratory program with finite manpower and monetary resources, requires ranking candidate areas in order of their preferability for further study. Preferability will reflect not only geologic attributes but environmental considerations as well. In fact, nongeologic information can be used to help focus additional exploratory geologic work. The purpose of this report is two-fold:

1. To document additional environmental information about areas in northeastern Ohio and south central New York which were identified in the Salina regional report[6] as being of potential interest for further geologic exploratory work.

2. To report observations on environmental data such as population density; socioeconomics; recreational, natural, archaeological, and historical areas; transportation systems (highways, railways, and waterways), and surface- and ground-water availability, and to identify the potential influence of these factors on selecting the location of a repository in northeastern Ohio or south central New York.

1.3 Summary and Conclusions

Stone & Webster[6] identified certain areas of the Salina basin in Ohio and New York that, based on regional geologic information, appear favorable for further exploration in the next phase of the program. Preliminary environmental studies of the suggested northeastern region of Ohio show this area to be either heavily urbanized (Cleveland suburbs) and developed or likely to become urbanized in the future. New York Study Area 1 and the Beaver Dams Subarea are rural in nature, while Study Area 2 has one population center of 20,505 persons.

From a recreational point of view, the Ohio area contains no state parks (four parks and one state forest are adjacent). New York Study Area 1 is essentially free of recreational or natural areas; Study Area 2 contains many state forests, a game management area, and a state park located in and around the area. A portion of the Beaver Dams Subarea is state forest land.

The Ohio study area has approximately 16 historic sites in and adjacent to the area. No historic places have been identified in New York Study Area 1 or the Beaver Dams Subarea, while Area 2 contains three sites and one historic district.

FIGURE 2 POTENTIAL AREAS PROPOSED FOR FURTHER EXPLORATION IN THE SALINA BASIN, NEW YORK AND OHIO

All three areas and the subarea have good highway and rail-transport access. More information is needed on the agricultural viability of all areas before any substantial evaluation can be made. These data would be especially useful for New York Study Area 1, which is predominantly rural.

Surface- and ground-water usage are much greater in the urbanized Ohio area; because of its rural nature, New York Study Area 1 and the Beaver Dams Subarea have the lowest demand for either water source.

This preliminary examination revealed no environmental reasons for excluding the search areas of geologic interest in New York from further study. Of the New York areas, Study Area 1 appears to provide greater possibilities, considering the objective of minimizing environmental impact.

The Ohio st[illegible] includes a large part that is within the urbanized area (as defined by the U.S. Ce[illegible] Bureau) surrounding Cleveland. In addition, the entire study area is marked by a high density of other screening factors such as historic and archaeological sites, natural areas and scenic highways. While more detailed study in the Ohio area might reveal subareas relatively lightly developed and sufficient in size for a repository, significant land use conflicts are likely for most of the area of geologic interest. The Ohio area, from a nongeologic standpoint, appears to be the least promising of the areas identified.

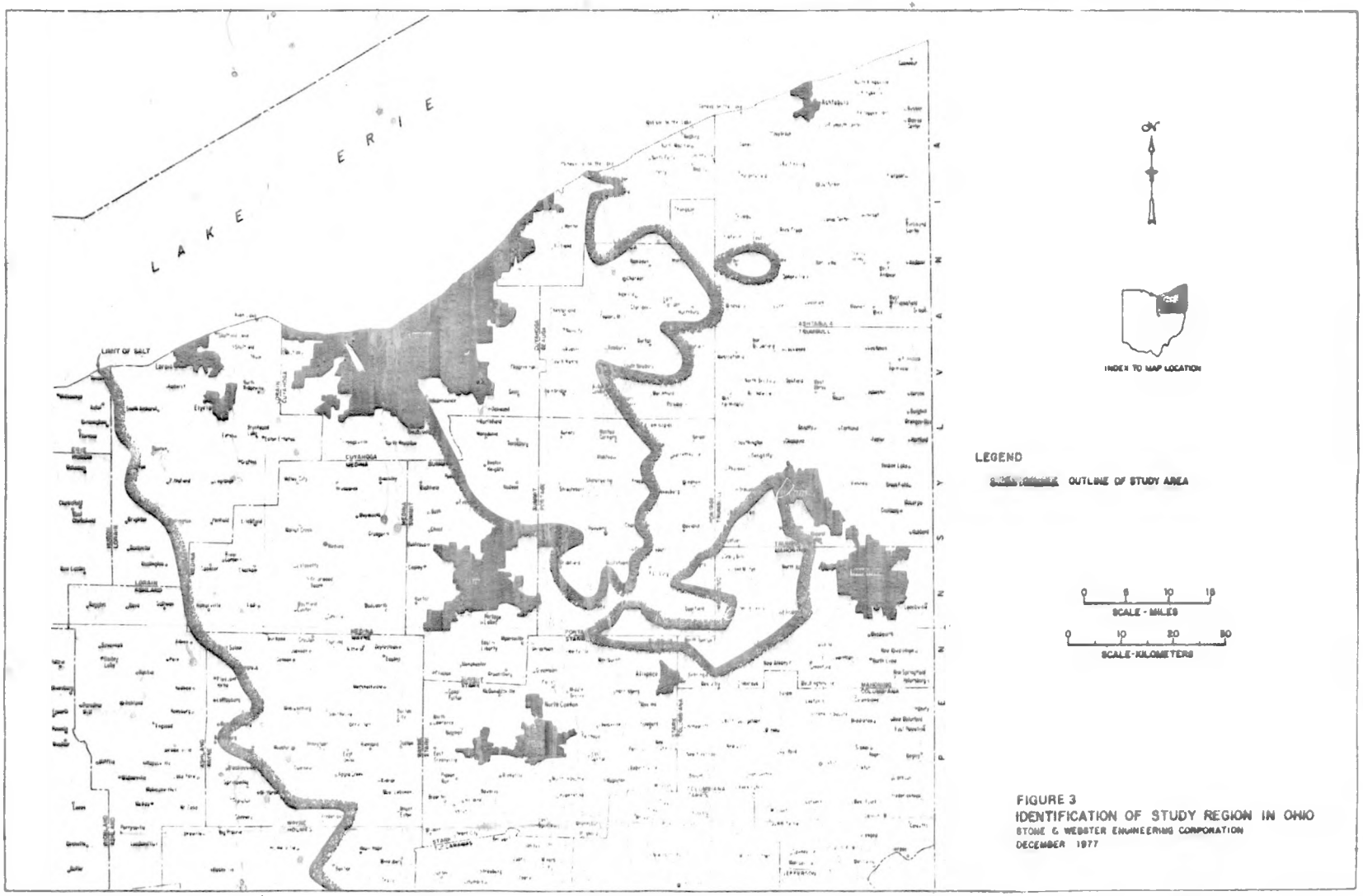
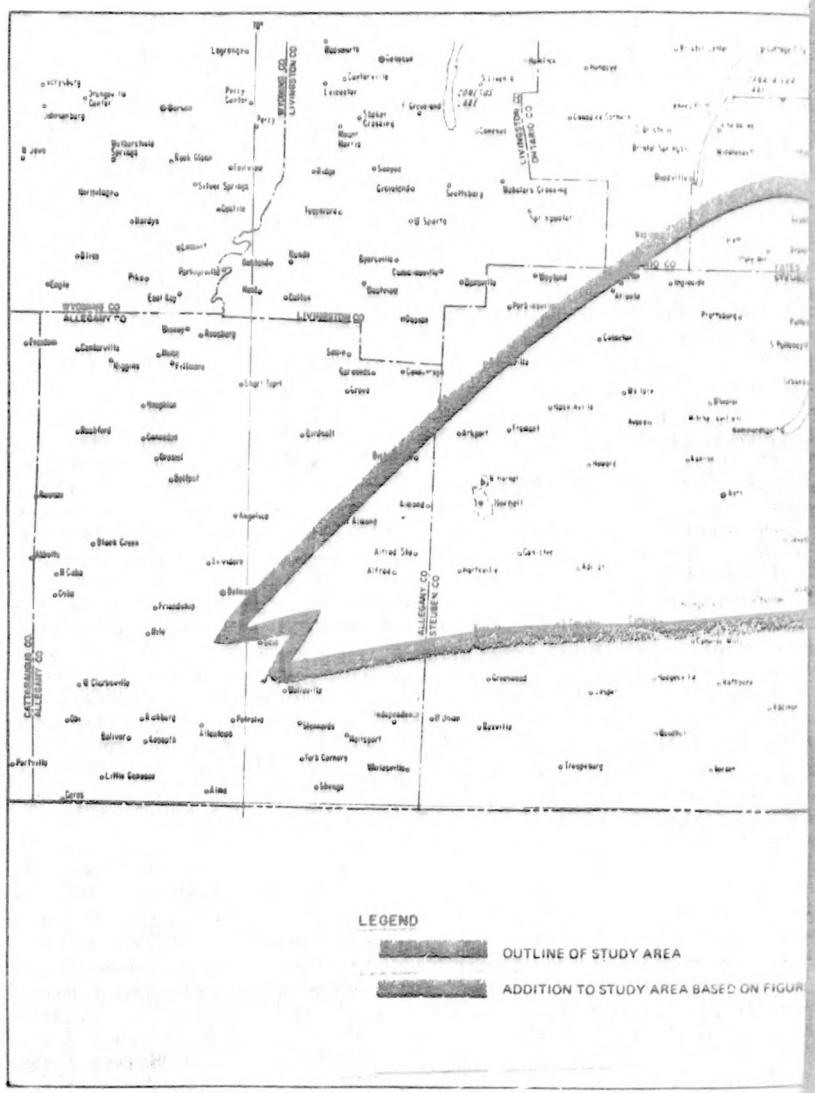
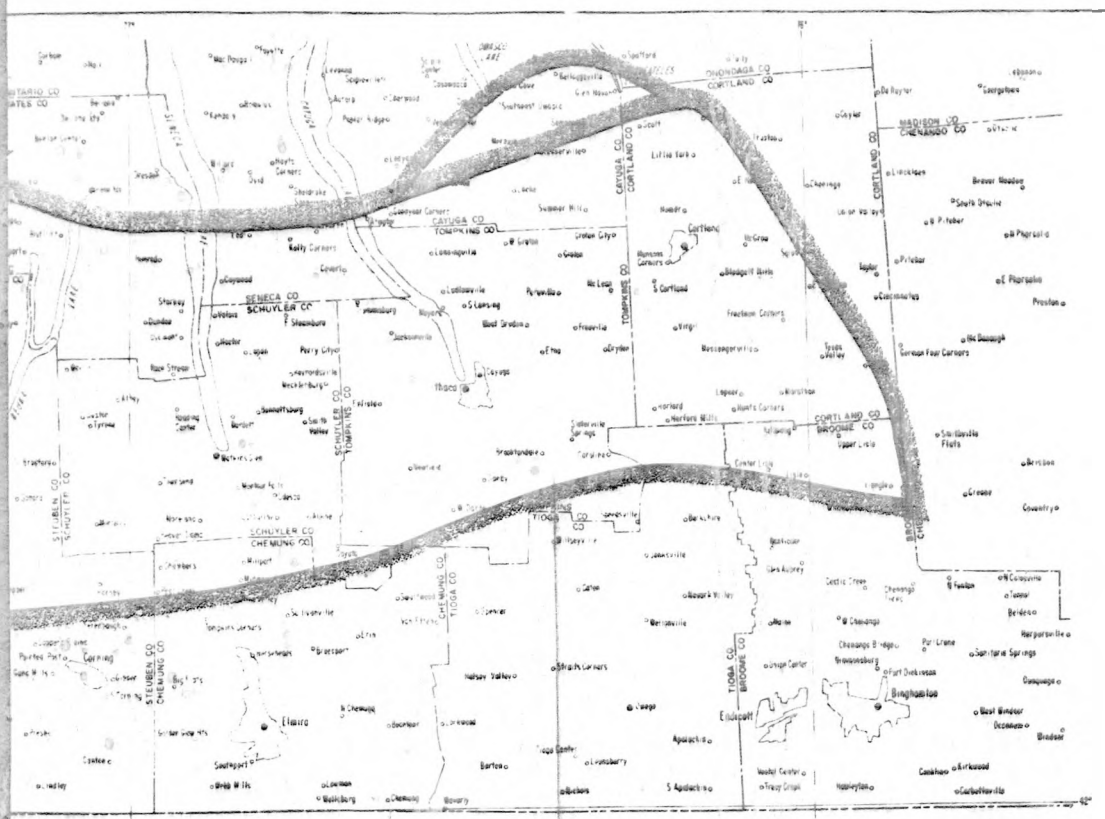
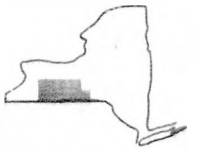


FIGURE 3
IDENTIFICATION OF STUDY REGION IN OHIO
STONE & WEBSTER ENGINEERING CORPORATION
DECEMBER 1977


LEGEND
OUTLINE OF STUDY AREA
ADDITION TO STUDY AREA BASED ON FIGUR





INDEX TO MAP LOCATION

2.2-11 (Ref. 8)

FIGURE 4
IDENTIFICATION OF STUDY AREA IN NEW YORK
STONE & WEBSTER ENGINEERING CORPORATION
DECEMBER 1977

LEGEND

3000 FOOT DEPTH

BORDER OF STUDY AREA

WELLS PENETRATING SALINA GROUP

OIL FIELD

GAS FIELD

GAS STORAGE

BRINE FIELD

HIGH DENSITY AREA OF WELLS PENETRATING SALINA GROUP

LIQUID GAS STORAGE

FAULT (U-UPTHROWN, D-DOWN, ?-KNOWN)

ACTIVE BRINE WELL

ABANDONED BRINE FIELD

ROCK SALT MINE

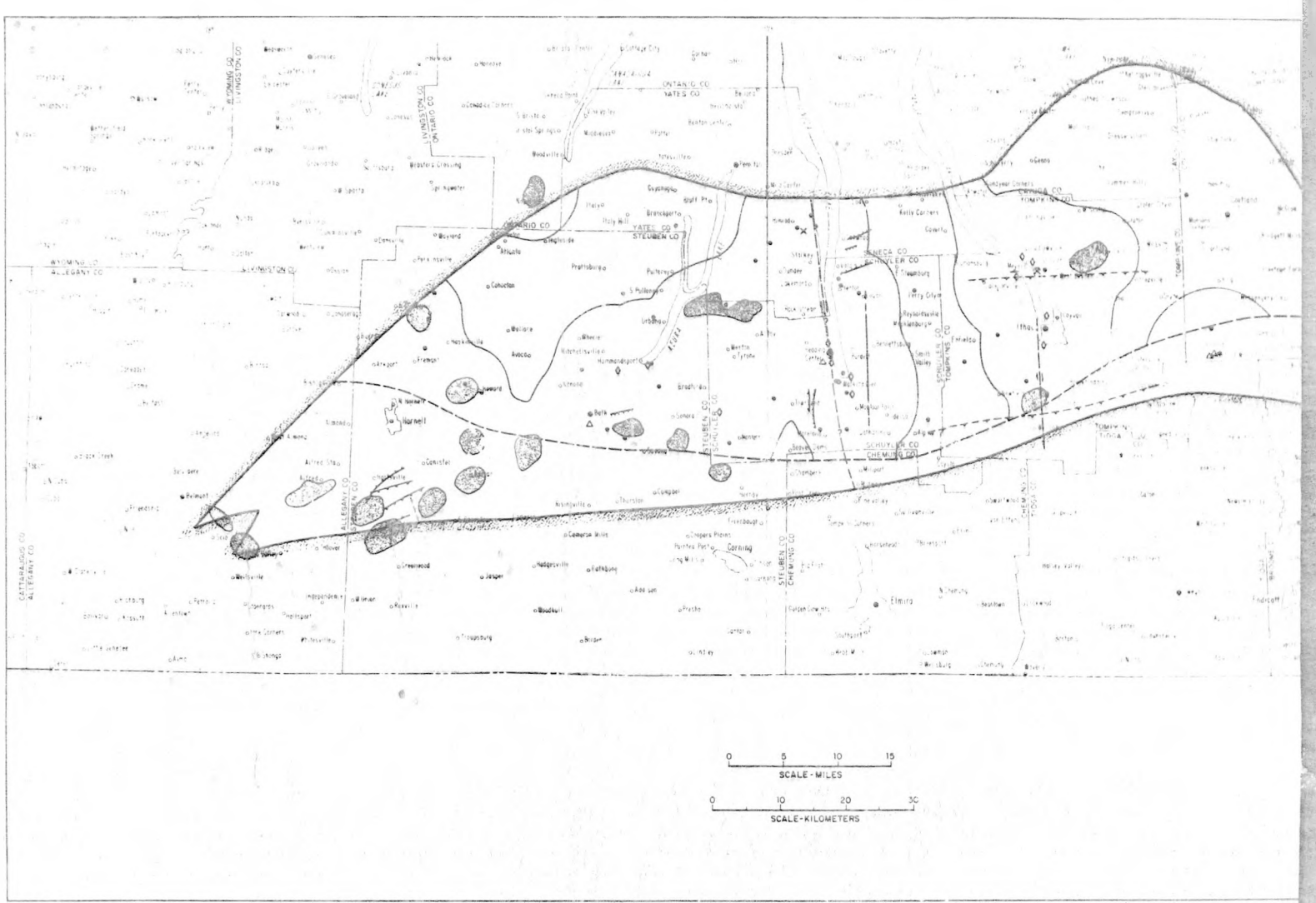
NOTE
NUMBERS ARE OHIO GEOLOGICAL SURVEY ROCK NUMBER

0 5 10
SCALE: MILES

0 10
SCALE: KILOMETERS

SOURCES DeBrosse & Vohemmer (1974, Outfield (1977)
Ohio Geological Survey, Oil & Gas Wells reaching Trig... Deeper Units OF-22(4/74), OF-41(2/74), OF-49(5/75), OF-5(12/75), OF-6(3/74)
Preliminary Map of Cuyahoga County

FIGURE 5
AREAS FAVORABLE FOR FURTHER EXPLORATION IN OHIO STUDY AREA
STONE & WEBSTER ENGINEERING CORPORATION
DECEMBER 1977


0 5 10 15
SCALE - MILES
0 10 20 30
SCALE-KILOMETERS

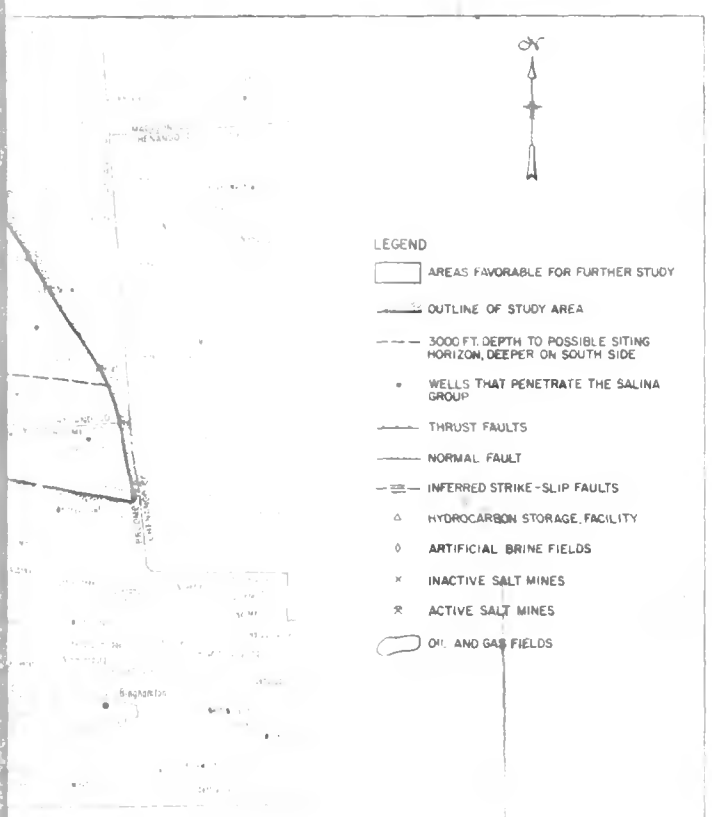


FIGURE 6
AREAS FAVORABLE FOR FURTHER EXPLORATION IN NEW YORK STUDY AREA
STONE & WEBSTER ENGINEERING CORPORATION
DECEMBER 1977

Category 1. Criteria based on legal constraints that exclude the use of certain lands for other than defined purposes.

Category 2. Criteria that reflect the practicality of avoiding (a) the preemption of present or projected land uses that are not compatible with repository requirements and (b) areas where development would be unjustifiably expensive.

Screening factors used in this preliminary study are as follows:

Category 1

- Wilderness areas
- Wild and scenic rivers
- Threatened and endangered species
- Parks and monuments
- Historical and archaeological sites
- Extraordinary natural features

Category 2

- Urbanized areas and population centers
- Groundwater resources
- Surface-water resources
- Terrain
- Natural areas (national and state forests, game management and wildlife preserves and similar areas)
- Mineral resources
- Indian reservations
- Potentially interactive areas
- Accessibility

In light of the regional geologic study that identified areas in northeastern Ohio and south central New York as being potentially attractive from a geologic standpoint, NUS was requested to assess the environmental (nongeologic) data developed during the regional environmental study[4] including such other area data as were readily available.

It should be noted in the following environmental evaluation (Section 3 through 6) that the areas analyzed were suggested by Stone & Webster in an early draft (spring, 1978) of their regional report.[6] With additional screening analysis, the recommended areas for further study were modified slightly in their configuration and in the subsequently published geologic report (October, 1978).[6] The environmental data and mapping overlays in this report were developed for the initial study areas recommended by Stone & Webster. For the purposes of this report, it is our judgement that the analysis and conclusions would not be altered by the slight changes in study-area configuration. Therefore, the environmental evaluation and supporting map overlays have not been modified to reflect the minor changes in suggested study areas.

In brief, as a basis for the preliminary evaluation that follows, NUS was asked (1) to determine whether there were any readily discernible environmental reasons why further studies in the areas identified should be precluded and (2) to identify to the extent possible by a limited survey what subareas might preferentially be examined in the follow-on studies. Information used was that presented in the Salina Environmental Characterization Report[4] and other relevant data assembled from a limited literature search.

3. EVALUATION OF THE NORTHEASTERN OHIO STUDY AREA

Because the northeastern section of Ohio borders Lake Erie and is extensively developed, this preliminary examination focused on urban developments, land use, and demographic factors. Other environmental aspects were considered, but in less detail.

3.1 Demography

3.1.1 Population Centers and Urbanized Areas

The study area, which is bordered on the west by the city of Cleveland, Ohio, contains many urban areas. These are concentrated primarily along the western edges of the study area. The largest of the suburban communities of Cleveland are Willowick, Eastlake, Willoughby, and Solon. Each of these incorporated cities has between 10,000 and 49,000 inhabitants. Communities with 5,000 to 10,000 inhabitants include Pepper Pike, Macedonia, and Streetsboro. Other principal urban areas are Hudson, Oakwood, Chagrin Falls, and Chardon.[7] The suburban counties that make up most of the study area, Lake, Geauga, and Portage, have grown substantially in the past decade, all by more than 30 percent from 1960 to 1970. This rapid growth rate is not expected to continue, but as the Cleveland region expands, increasing urban growth is likely in these counties.

Generally, the Northeastern Ohio Study Area is suburban and exurban in character. There are over 50 incorporated and unincorporated places with 1,000 or more inhabitants in this study area (Figure 7). The highly populated Cleveland area extends into the western portions of the study area. The hatched overlay shows the extent of the Cleveland urbanized area. The figure also indicates population centers in and adjacent to the study area.

3.1.2 Population Density

Table 1 contains population density breakdowns, by subdivision, for the following five counties: Geauga, Lake, Cuyahoga, Portage, and Summit.[7,8]

Generally, population densities are higher in the western part of the study area, near the City of Cleveland. Preliminary data show that the population densities range from a high of 8,006 persons per square mile to a low of 53 persons per square mile.[7] The overall population density for the study area is high, because of the extent of urbanization in the western portion of the area.

Figure 8 supplements the urban area data of Figure 7. It shows population densities (number of persons per square mile) for county subdivisions. Part of Geauga, Lake, Cuyahoga, Summit, and Portage Counties are within the study area.

3.2 Socioeconomics

Economic data were generated to further illustrate the basic characteristics of each study area and to support the land use and population information. the economic data of itself, however, does not provide any further estimation of environmental preferability between the four areas.

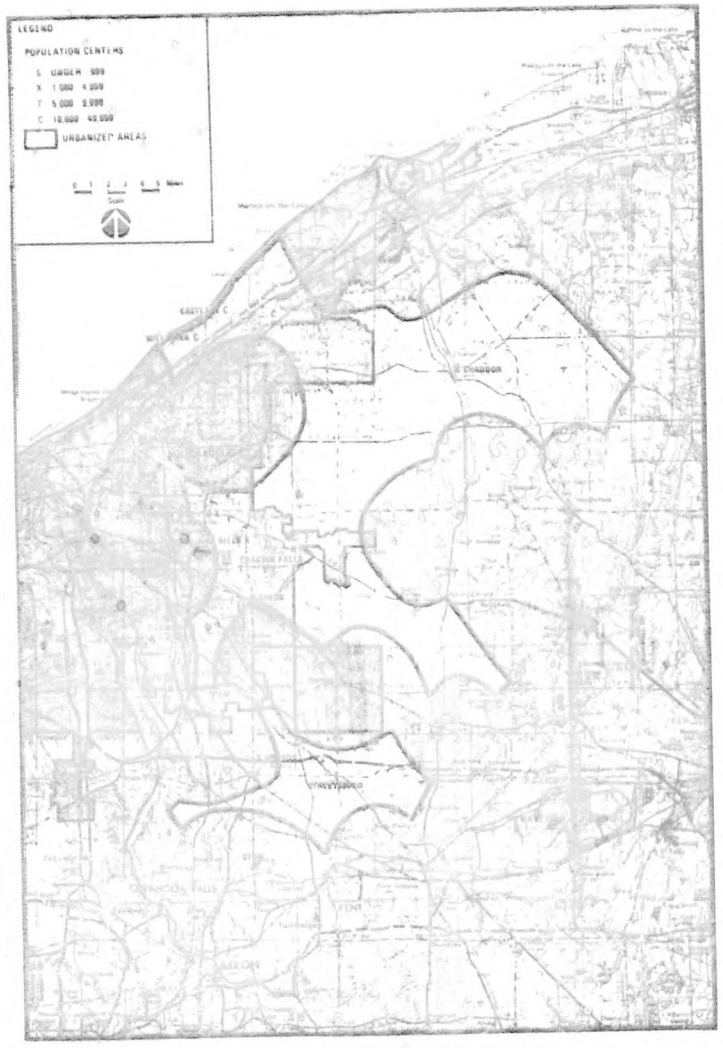


FIGURE 7 POPULATION CENTERS AND URBANIZED AREAS – NORTHEASTERN OHIO STUDY AREA

TABLE 1
1975 POPULATION ESTIMATES AND POPULATION DENSITIES BY COUNTIES AND SUBDIVISIONS NORTHEASTERN OHIO STUDY AREA[7,8]

COUNTY/Subdivision		July 1, 1975 Population	Area, mi^2	Population Density (Persons/$mile^2$)
GEAUGA COUNTY		68,144	407	167
	Chardon (T)	7,913	26.9	294
	Chardon (C)	4,397	NA	NA
	Hambden (T)	2,931	22.1	133
	Montville (T)	1,499	24.1	62
	Chester (T)	11,236	23.6	476
	Munson (T)	3,953	25.8	153
	Claridon (T)	2,741	22.8	120
	Aquilla (C)	457	NA	NA
	Huntsburg (T)	1,996	24.5	81
	Russell (T)	8,050	24.3	331
[HV]	Hunting Valley - Part (V)	134	NA	NA
	South Russell (V)	2,896	NA	NA
	Newbury (T)	4,579	28.3	162
	Bainbridge (T)	7,130	25.4	281
	Auburn (T)	1,561	29.7	53
LAKE COUNTY		206,881	231	895
[E]	Eastlake (C)	21,805	6.7	3,254
[K]	Kirtland (C)	6,063	23.7	288
[KH]	Kirtland Hills (V)	463	NA	NA
[WaH]	Waite Hill (V)	534	NA	NA
[Wi]	Willoughby (C)	19,896	10.3	1,932
[WH]	Willoughby Hills (C)	6,842	10.9	628
[Wc]	Wickliffe (C)	18,365	4.7	3,907
[Wo]	Willowick	19,614	2.45	8,006

CUYAHOGA COUNTY		1,592,613	456	3,492
	Euclid (C)	63,307	NA	NA
[GM]	Gates Mills (T)	2,252	NA	NA
[HV]	Hunting Valley - Part (V)	696	NA	NA
[PP]	Pepper Pike (C)	5,788	NA	NA
[BW]	Beachwood (C)	10,908	NA	NA
[Wm]	Woodmere (V)	1,141	NA	NA
[Wv]	Warrensville (T)	2,070	NA	NA
[O]	Orange (V)	2,329	NA	NA
[MH]	Moreland Hills (V)	3,652	NA	NA
[C]	Chagrin Falls (T)	82	NA	NA
[CF]	Chagrin Falls (V)	4,839	NA	NA
[S]	Solon (C)	12,617	NA	NA
[B]	Bentleyville (V)	379	NA	NA
[G]	Glenwillow (V)	538	NA	NA
[Ow]	Oakwood (V)	4,429	NA	NA
SUMMIT COUNTY		534,900	408	1,311
[M]	Macedonia (C)	6,057	NA	NA
	Hudson (T)	10,250	NA	NA
[H]	Hudson (V)	4,614	NA	NA
	Boston (T)	2,118	NA	NA
PORTAGE COUNTY		132,257	495	267
	Mantua (T)	5,597	NA	NA
[Ma]	Mantua (V)	1,228	NA	NA
	Hiram (T)	3,159	NA	NA
[Hi]	Hiram (V)	1,688	NA	NA
	Shalersville (T)	5,319	NA	NA
	Streetsboro (C)	8,084	NA	NA
[SBK]	Sugar Bush Knolls (V)	124	NA	NA
	Franklin (T)	33,130	NA	NA

[ ] - Letters inside brackets refer to places on Population Density figure.
(T) - Township
(C) - City
(V) - Village
NA - Not Available

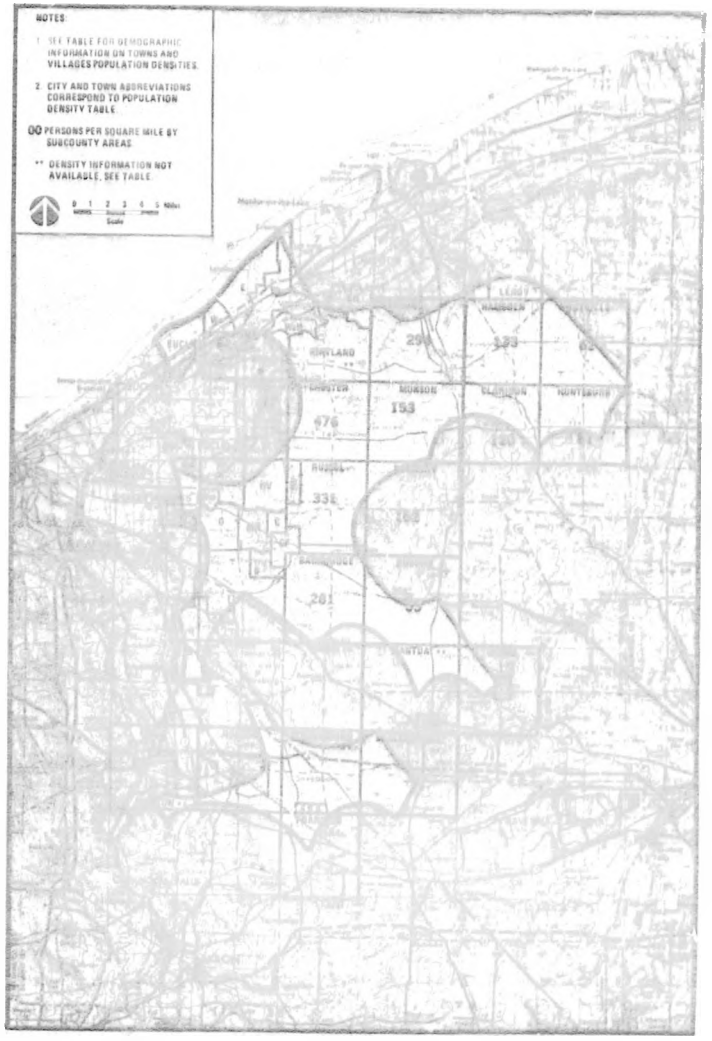


FIGURE 8 PERSONS PER SQUARE MILE BY SUBCOUNTY AREAS – NORTHEASTERN OHIO STUDY AREA

3.2.1 Economic Base

Within the five-county area of the Northeastern Ohio Study Area, manufacturing is the primary employment industry, accounting for 277,803 employees. Services and retail trade are the next most important employment categories, with 182,218 and 160,637 employees, respectively.[9] The number of employees in the principal industries is shown in Table 2, which also indicates the percentages of total employment for the major employment categories. Table 3 provides payroll estimates by major industry.

3.2.2 Mean Per Capita Income

Table 4 gives estimated per capita income for each county and county subdivision for the years 1969 through 1974.

3.3 Land Use

3.3.1 Recreational, Natural, Archaeological, and Historical Areas

There are no state parks within the Northeastern Ohio Study Area. Adjacent to the area are four state parks: Headlands Beach State Park, 120 acres; Punderson State Park, 89 acres; Tinkers Creek State Park, 1,183 acres; and Nelson-Kennedy Ledges State Park, 167 acres.[10,11] Headlands Beach is located north of the Ohio Study Area, Punderson State Park is located east of Chagrin Falls and south of Chardon, Tinkers Creek State Park is located south of the main portion of the study area, and Nelson Kennedy Ledges is located south and east of the study area. Table 5 provides additional information on recreational areas.

The only state forest adjacent to the study area is the 371-acre Chapin State Forest. It is located close to the center of the northern section of the study area, about 20 miles from the center of Cleveland. Figure 9 shows that there are no state parks within the study area. However, as indicated in Table 5, there are many public and private recreational and natural areas and numerous small fishing, hunting, and other recreational facilities in and around the study area.

In and adjacent to the study area are approximately 16 sites included in The National Register of Historic Places. The approximate locations of these areas are shown on Figure 10.[12]

3.3.2 Potentially Interactive Uses

Airports

There are no air-traffic hubs within the study area. The closest major airports are the Burke Lakefront Airport in Cleveland, approximately 10-15 miles west and the Cleveland Hopkins International Airport, more than 20 miles west, of the study area. Within and adjacent to the study area are numerous smaller air strips.[13] Figure 11 shows the locations of public and private airports in and around the study area.

TABLE 2

MAJOR INDUSTRY EMPLOYMENT
FOR 5-COUNTY OHIO STUDY AREA
FOR 5-COUNTY NORTHEASTERN OHIO STUDY AREA[9]

Industry	Number of Employees	Percent of Total
Agricultural services, forestry fisheries	2,284-3,932	.2% - .4%
Mining	2,110-2,408	.2% - .3%
Contract Construction	43,950	5%
Manufacturing	277,803	30%
Transportation and other public utilities	58,920	6.4%
Wholesale trade	69,719	7.6%
Retail trade	160,637	17.4%
Finance, insurance and real estate	48,583	5.3%
Services	182,318	19.8%
Non-classifiable establishments	4,105	.4%

For additional information on employment and payroll by major industry by county, see Table 3.

TABLE 3
COUNTY EMPLOYEES AND PAYROLL
BY MAJOR INDUSTRY FOR 1975
NORTHEASTERN OHIO STUDY AREA[9]

COUNTY/Industry	Number of Employees For Selected Week	Annual Payroll ($1000)
CUYAHOGA		
Agriculture services, forestry, fisheries	928	10,110
Mining	1,574	31,437
Contract construction	29,749	490,132
Manufacturing	230,045	3,012,072
Transportation and other public utilities	41,507	609,301
Wholesale trade	51,682	703,525
Retail trade	105,337	687,216
Finance, insurance, and real estate	36,228	361,554
Services	139,835	1,216,202
Non-classifiable establishments	2,748	25,701
GEAUGA		
Agricultural services, forestry, fisheries	38	377
Mining	195	2,122
Contract construction	584	9,311
Manufacturing	4,646	51,223
Transportation and other public utilities	399	4,340
Wholesale trade	454	4,784
Retail trade	1,962	11,145
Finance, insurance, and real estate	373	3,057
Services	1,750	13,690
Non-classifiable establishments	84	614

LAKE		
Agricultural services, forestry, fisheries	(C)	(D)
Mining	(C)	(D)
Contract construction	1,968	32,722
Manufacturing	26,172	321,320
Transporation and other public utilities	992	12,750
Wholesale trade	1,868	21,248
Retail trade	12,867	76,080
Finance, insurance, and real estate	1,711	18,045
Services	6,157	45,616
Non-classifiable establishments	244	2,235
PORTAGE		
Agricultural services, forestry, fisheries	(C)	(D)
Mining	(C)	(D)
Contract construction	966	11,697
Manufacturing	9,329	96,141
Transportation and other public utilities	783	9,197
Wholesale trade	781	8,155
Retail trade	4,284	31,106
Finance, insurance and real estate	892	5,974
Services	2,720	20,075
Non-classifiable establishments	182	1,574
SUMMIT		
Agricultural services, forestry, fisheries	218	1,962
Mining	137	1,688

Contract construction	10,653	178,332
Manufacturing	76,611	989,059
Transportation and other public utilities	15,279	223,806
Wholesale trade	14,938	205,128
Retail trade	35,207	220,167
Finance, insurance and real estate	9,379	96,711
Services	31,854	249,732
Nonclassifiable establishments	847	7,655

(C) 100-249
(G) 1,000-2,499
(D) Figures withheld to avoid disclosure of operations of individual establishments.

TABLE 4

ESTIMATED PER CAPITA INCOME
NORTHEASTERN OHIO STUDY AREA (8)

COUNTY/Subdivision	1974	1969	Percent Change 1969 to 1974
GEAUGA COUNTY	$ 4,883	$ 3,517	38.8
Chardon (T)	4,896	3,538	38.4
Chardon (C)	4,794	3,500	37.0
Hambden (T)	4,445	3,041	46.2
Montville (T)	3,638	2,478	46.8
Chester (T)	5,440	3,801	43.1
Munson (T)	4,966	3,459	43.6
Claridon (T)	4,507	3,315	36.0
Aquilla (C)	3,530	2,721	29.7
Huntsburg (T)	4,033	2,771	45.5
Russell (T)	6,391	4,971	28.6
Hunting Valley (V)	7,121	5,088	40.[illegible]
South Russel (V)	6,452	5,153	25.[illegible]
Newbury (T)	4,190	3,237	29.[illegible]
Bainbridge (T)	5,833	4,076	43.1
Auburn (T)	5,661	3,906	44.9
LAKE COUNTY	4,912	3,463	41.8
[K] Kirtland (C)	5,192	3,717	39.7
[KH] Kirtland Hills (V)	7,683	5,311	44.7
[WaH] Waite Hill (V)	12,049	8,281	45.5
[WH] Willoughby Hills (C)	5,046	4,052	49.2
[Wc] Wickliffe (C)	4,875	3,467	40.6
[Wo] Willowick	5,176	3,553	45.7
CUYAHOGA COUNTY	5,210	3,692	41.1
Euclid (C)	5,799	4,077	42.2
[GM] Gates Mills (R)	13,942	11,029	26.4
[HV] Hunting Valley-Part (V)	13,747	10,956	25.5
[PP] Pepper Pike (C)	13,574	9,661	40.5

[Bw]	Beachwood (C)	10,066	7,097	41.8
[Wm]	Woodmere (V)	5,979	4,641	28.8
[Wv]	Warrensville (T)	5,764	3,940	46.3
[O]	Orange (V)	6,614	5,098	29.7
[MH]	Moreland Hills (V)	10,950	7,062	55.1
[C]	Chagrin Falls (T)	13,824	9,570	44.4
[CF]	Chagrin Falls (V)	7,337	5,135	42.8
[S]	Solon (C)	6,167	4,[illegible]	38.1
[B]	Bentleyville (V)	6,997	5,507	27.0
[G]	Glenwillow (V)	5,484	3,858	42.1
[Ow]	Oakwood (V)	4,470	3,247	37.7
SUMMIT COUNTY		4,914	3,439	42.9
[M]	Macedonia (C)	5,119	3,523	45.3
	Hudson (T)	7,175	5,246	36.8
[H]	Hudson (V)	7,533	5,332	41.3
	Boston (T)	6,010	4,278	40.5
PORTAGE COUNTY		4,370	3,075	42.1
	Mantua (T)	4,285	3,083	39.0
[Ma]	Mantua (V)	5,065	3,519	43.9
	Hiram (T)	3,587	2,659	34.9
[Hi]	Hiram (V)	2,886	2,075	39.1
	Shalersville (T)	3,779	2,669	41.6
	Streetsboro (C)	3,880	2,802	38.5
[SBK]	Sugar Bush Knolls (V)	5,458	3,801	43.6
	Franklin (T)	4,231	3,014	40.4

[ ] - Letters inside brackets appear as place references on Population Density figure.
(T) - Township
(C) - City
(V) - Village

TABLE 5

PUBLIC AND PRIVATE RECREATIONAL AREAS
NORTHEASTERN OHIO STUDY AREA [10,11]

	Name	Ownership	Acreage
GEAUGA COUNTY			
1.	East Branch Chagrin River	Private	3
2.	Holden Arboretum	Private	876
3.	Big Creek Park	State	1105
4.	Whittam Memorial Forest	State	100
5.	State Route 608 (11.6 miles)	State	116
6.	Hambden Orchard Wildlife Area	State	842
7.	Aquilla Lake Wildlife	State	44
8.	State Route 322	State	214
	Wisllow Sporting Club	Private	85
	Winchester Public Shooting Center	Private	88
	Kelso Lake	Private	37
	Paradise Beach	Private	57
9.	East Brach Reservior	City of Akron	1105
10.	State Route 528	State	197
11.	Punderson State Park	State	890
12.	La Due Reservoir (stream easements)	City of Akron	3349
	Frily Newbauers Fish and Game Farm	Private	3000
	Snow Lake Fish and Hunt Club	Private	241
	Sun Rise Farm	Private	175
	Kelso Lake	Private	50
	Burton lake	Private	32
13.	State Route 422 (scenic highway)	State	210

14.	Undeveloped Site	Geauga County Park Board	100
15.	Geauga Lake Park	Private	88
16.	State Route 528	State Highway	197
PORTAGE COUNTY			
17.	Tinkers Creek State Park	State	1143
18.	Aurora Lake Park	Sta e	1200
19.	Burtscher Landing	Private	43
SUMMIT COUNTY			
20.	Brady Lake Park	Private	30
21.	Spring Springs	City of Stow	50
22.	Tinkers Creek State Park	State	---
23.	State Route 303	State	174
CAYAHOGA COUNTY			
24.	North Chagrin Reservation	Cleveland Metropolitan Park District	860
25.	Chagrin Valley Parkway	Cleveland Metropolitan Park District	191
26.	South Chagrin Reservation	Cleveland Metropolitan Park District	614
27.	Bedford South Chagrin Parkway	Cleveland Metropolitan Park District	691

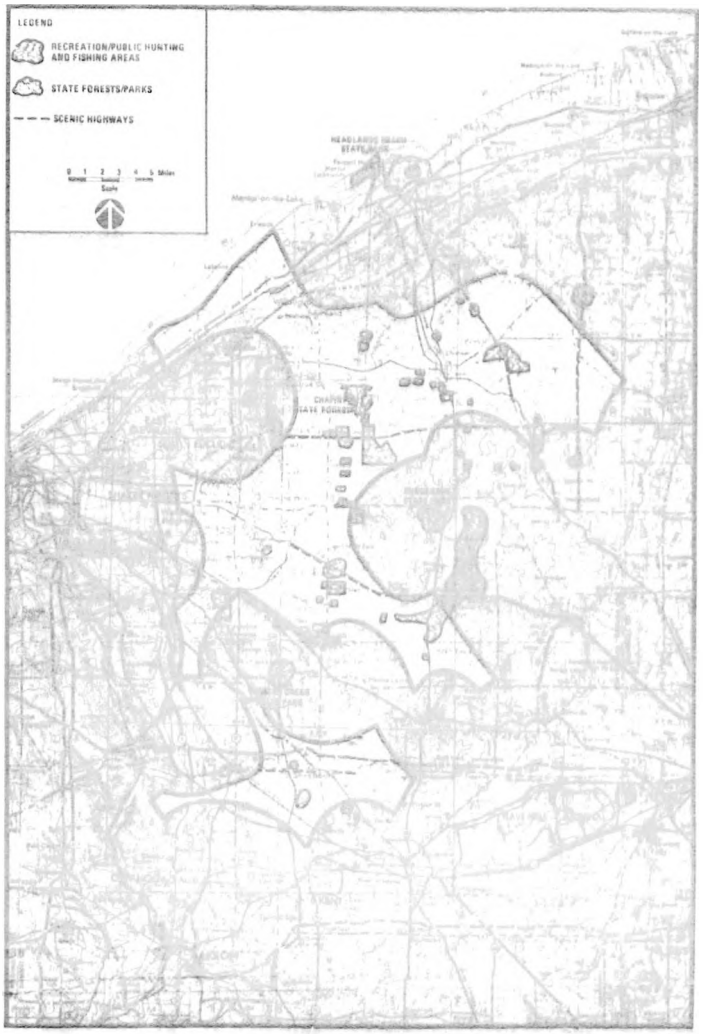


FIGURE 9 RECREATIONAL, NATURAL AND OTHER AREAS – NORTHEASTERN OHIO STUDY AREA

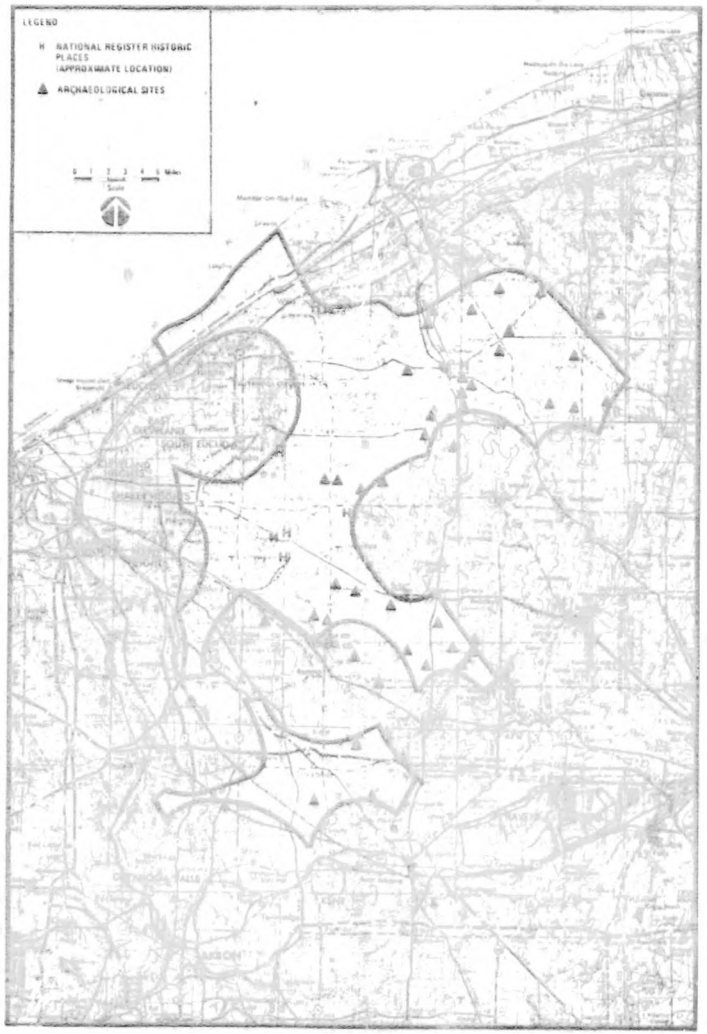


FIGURE 10 HISTORIC PLACES AND ARCHEOLOGICAL SITES – NORTHEASTERN OHIO STUDY AREA

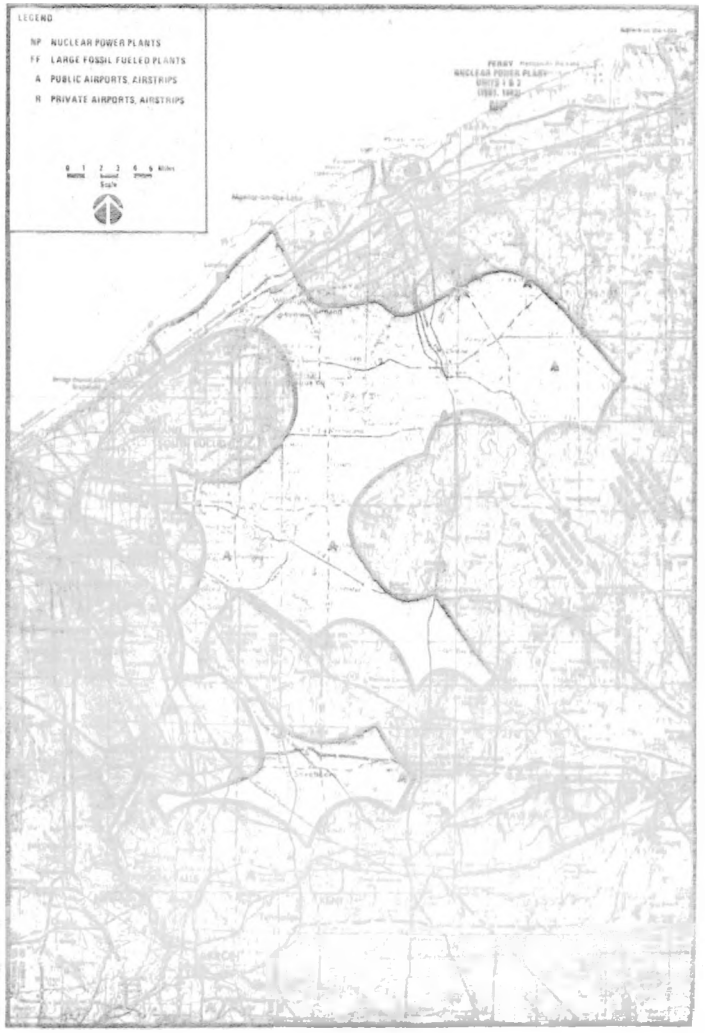


FIGURE 11 POTENTIALLY INTERACTIVE USES – NORTHEASTERN OHIO STUDY AREA

Nuclear Power Plants

There are no nuclear power plants within or adjacent to the study area. The Perry Nuclear Power Plant is under construction on the Lake Erie shore, about 20 miles north-northeast of the center of the study area (Figure 11). Distances to other nuclear power plants are also indicated in Figure 11.

Large Fossil-Fired Plants

There is one fossil-fired plant in the study area, located at Eastlake.

Concentrated Interactive Uses

The extent of concentrated potentially interactive uses in and proximal to the study area has not been determined as part of this study.

Information on military bases is incomplete.

3.4 Transportation Systems

3.4.1 Highways

The study area is served by a well-developed network of interstate, U.S., state, county, and local roads, as shown in Figure 12.

The principal interstate highways that serve Cleveland and northeastern Ohio are Interstate 80 which, runs east-west and is south of the study area; Interstates 480 and 271, which run north-south on the western edge of the study area; and Interstate 90, which runs in an approximately east-west direction north of the study area. Major U.S. highways through the area are U.S. Highways 422, 322, and 6. These three roads generally run in the east-west direction in various parts of the study area. The principal state highways that serve the area are Route 44, which runs north-south, and Route 87, which runs east-west. The area is also served by many other connecting and local roads.

Routes 608 and 528 which traverse the northeastern section of the study area, are both considered scenic highways.

3.4.2 Railroads

There are several Class I and Class II railroads that serve the study area and adjoining places. The principal lines are operated by the Norfolk and Western Railroad, the Baltimore and Ohio Railroad, the U.S. Government, and by Consolidated Railroad (Conrail). Figure 13 presents information on the location and service areas of railroads operating in and around the northeastern section of Cleveland.

3.5 Indian Reservations

No Indian Reservations have been identified in the available literature.

FIGURE 12 TRANSPORTATION SYSTEMS – HIGHWAYS – NORTHEASTERN OHIO STUDY AREA

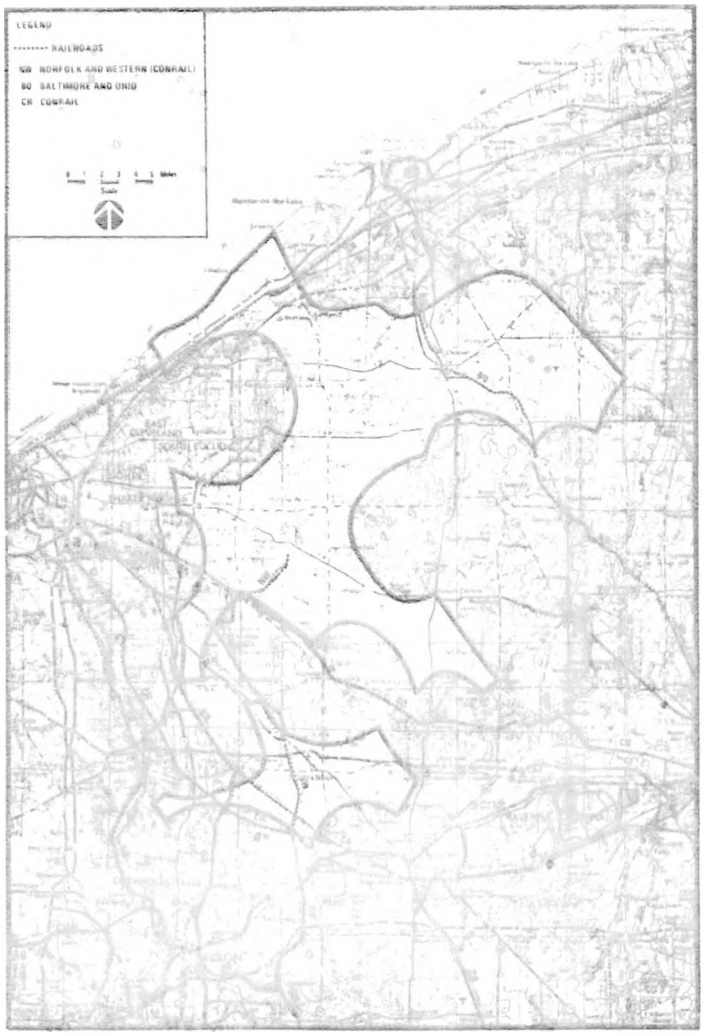


FIGURE 13 TRANSPORTATION SYSTEMS – RAILWAYS – NORTHEASTERN OHIO STUDY AREA

3.6 Land-Use Patterns

Urban development is occurring throughout the study area, but currently the majority of activity is in the western sector, adjacent to the Cleveland area. As available sites for development become scarce in the western sector, the growth is expected to move gradually eastward.

No data were developed as a result of this preliminary survey to rate the agricultural viability of lands within the study area.

3.7 Surface-Water Resources

The Northeastern Ohio Study Area is located partly in the Chagrin River basin and partly in the Cuyahoga River basin. Both river basins empty into Lake Erie. Major streams in the Northeastern Ohio Study Area are shown in Figure 14. About 90 percent of the water use in the study area is from surface sources. On a county basis, average surface-water uses in and near the study area are as follows:[6] Cuyahoga, 373.2 MGD, Summit, 31.5 MGD, Lake, 20.9 MGD, Portage, 1.2 MGD, and Geauga, 0.8 MGD.

3.8 Ground-Water Resources

Sand and gravel beds within the unconsolidated sediments are the most permeable portion and form the principal aquifers. Water infiltrates into the ground-water aquifers wherever the soil is sufficiently permeable. This ground-water is derived directly from precipitation or indirectly from surface bodies of water. Ground-water availability in the Northeast Ohio Study Area is presented in Figure 15. As shown, major productive aquifers are located mainly in the alluvial valleys of perennial streams. These ground-water sources are replenished by recharge from these surface streams.[6]

About 10 percent of the water use in the study area is derived from wells and springs. The average ground-water uses for the counties in the study area are as follows:[6] Cuyahoga, 26.7 MGD, Summit, 25.8 MGD, Portage, 10.9 MGD, Lake, 6.7 MGD, and Geauga, 4.3 MGD.

3.9 Preliminary Environmental Assessment

Figure 16 is an Ohio study area composite of all the information given in the preceding figures. The composite indicates that much of the land within the study area may have existing uses that are restrictive or otherwise unattractive to the development of a large scale facility that requires large ownership and control areas.

While certain subareas, such as the most eastern sector of the defined geologic area, offer some possibilities, this limited environmental assessment of nongeological aspects indicates that the search emphasis in the northeastern Ohio region should be given a lower priority than other areas identified by Stone & Webster.

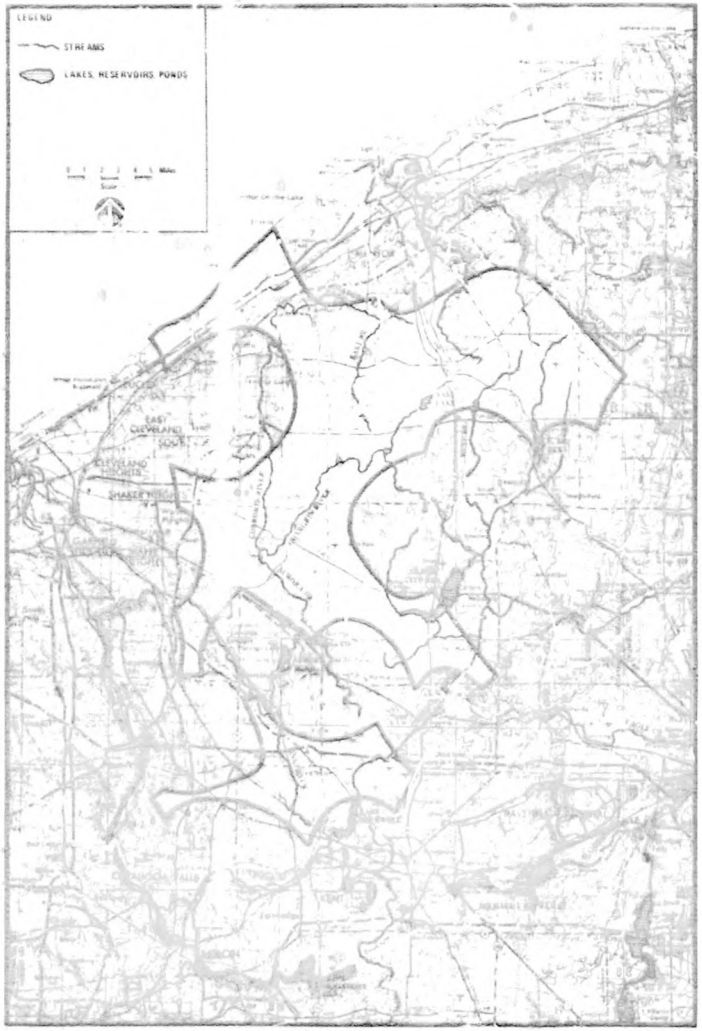


FIGURE 14 SURFACE WATER DRAINAGE FEATURES IN NORTHEASTERN OHIO STUDY AREA

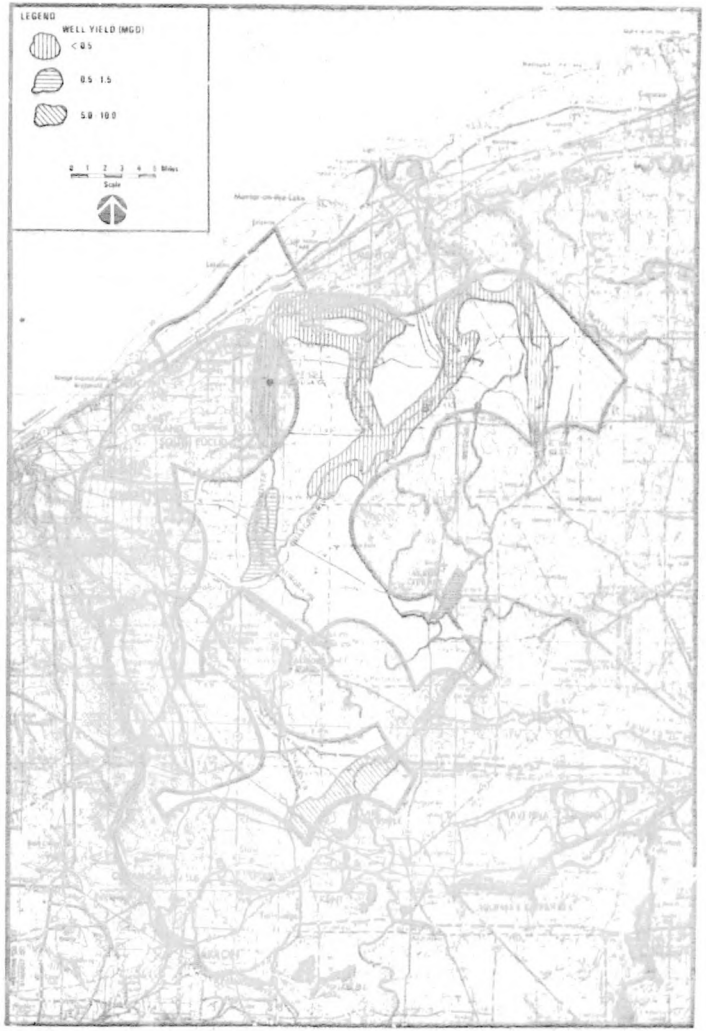


FIGURE 15 GROUNDWATER AVAILABILITY IN NORTHEASTERN OHIO STUDY AREA

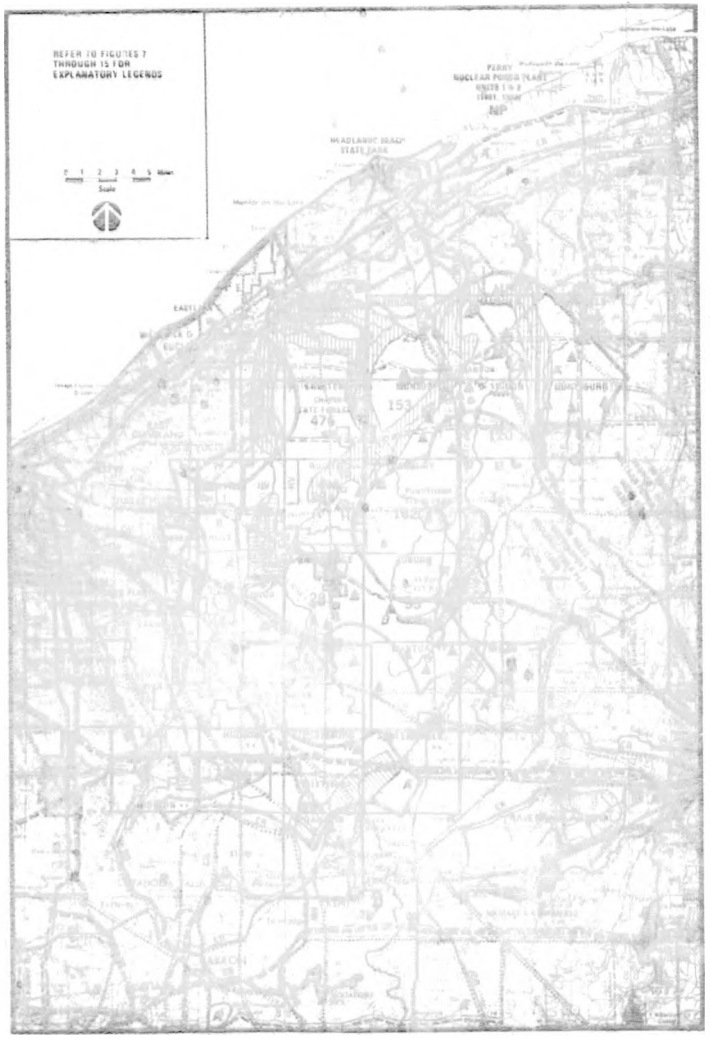


FIGURE 16 NORTHEASTERN OHIO STUDY AREA COMPOSITE

4. EVALUATION OF NEW YORK STUDY AREA 1

The recommended areas favorable for further exploration in south central New York* fall into three subareas (Figure 6). For ease in data handling, the western subarea (parts of Steuben and Yates Counties) has been designated Study Area 1. The two eastern subareas, one between Seneca and Cayuga Lakes and the other covering portions of Tompkins, Cayuga, and Cortland counties, have been analyzed collectively as Study Area 2. This section presents environmental data for Study Area 1.

4.1 Demography

4.1.1 Population Centers and Urbanized Areas

Study Area 1 is located west and southwest of the Finger Lakes Region of New York. It consists of parts of two primarily rural New York counties, Steuben and Yates. There are no urban areas with over 5,000 inhabitants in the area, but Penn Yan, located approximately 5 miles north-northeast, had 5,210 inhabitants in 1975.

The principal population centers within the area are Prattsburg, Cohocton, and Avoca (Figure 17). In 1970, Prattsburg had a population of 765 inhabitants. Cohocton and Avoca had respective estimated populations of 979 and 1229 inhabitants in 1975. Bath, located approximately 5 miles southeast of the area, had a 1975 population of 6,298 persons.[7]

4.1.2 Population Density

Figure 18, which shows the population density and supplements the urban area data of Figure 17, displays the minor civil divisions within or adjacent to Study Area 1. The population densities of the minor civil divisions range from a high of 133 to a low of 14 persons per square mile.[8,14] The overall population density for the area of minor civil divisions portrayed is approximately 52 persons per square mile. Within the study area, the central portion has the lowest population density, while areas on the periphery of the central area tend to have higher population densities.

Table 6 contains population density breakdowns by subdivision for Yates and Steuben Counties.

4.2 Socioeconomics

Economic data were generated to further illustrate the basic characteristics of each area and to support the land use and population information. The economic data, of itself, however, does not provide any further estimation of environmental suitability between the four areas.

4.2.1 Economic Base

Within the three county area* in which Study Area 1 lies, the primary employment industry is manufacturing, accounting for 19,085 employees. Retail trade and services

*A third county, Ontario, has been included in this section because of its proximity on the northern edge of the boundary.

FIGURE 17 POPULATION CENTERS AND URBANIZED AREAS –
NEW YORK STUDY AREA 1

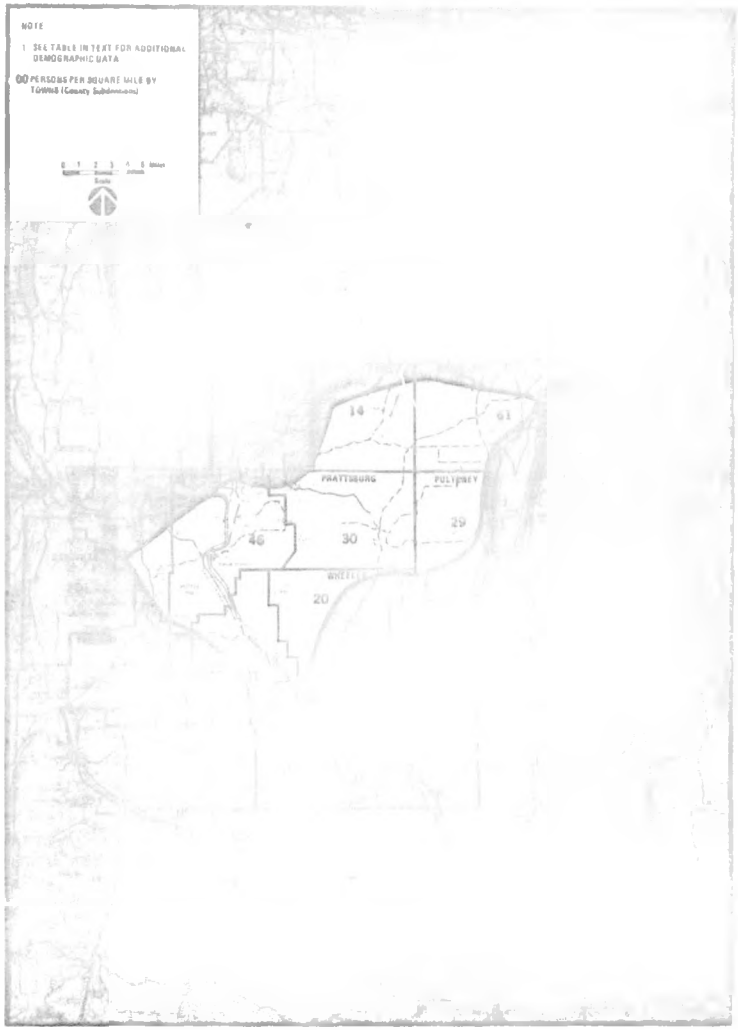


FIGURE 18 PERSONS PER SQUARE MILE BY SUBCOUNTY AREAS
NEW YORK STUDY AREA 1

TABLE 6

1975 POPULATION ESTIMATES AND POPULATION DENSITIES BY COUNTIES AND SUBDIVISIONS NEW YORK STUDY AREA 1[8,14]

COUNTY/Subdivision	July 1, 1975 Population	Area, mi^2	Population Density (Persons/$mile^2$)
YATES COUNTY			
Italy (T)	580	40.8	14
Jerusalem (T)	3,654	59.9	61
STEUBAN COUNTY			
Prattsburg (T)	1,579	52.7	30
Prattsburg (C)	765*	NA	NA
Cohocton (T)	2,625	56.8	46
Cohocton (C)	979	NA	NA
Wayland (T)	3,965	39.9	99
Avoca (T)	2,218	36.3	61
Avoca (C)	1,229	NA	NA
Wheeler (T)	932	47.0	20
Urbana (T)	2,988	42.3	71

* 1970 population
NA Not Available
(T) Towns (townships)
(V) Village
(U) Unincorporated place

are the next most important employment categories with 10,034 and 8,039 employees, respectively.[9] Total employment by major employment category and its percentage of total employment within the three county area is given in Table 7.

Table 8 provides economic data for the three-county area, including employment and annual payroll for major industries in the area.

4.2.2 Mean Per Capita Income

The average per capita income for the three-county area was $2,868 in 1970. The mean family income in 1970 for Ontario, Steuben and Yates Counties averaged $10,338. The three county 1970 average percentage of population with incomes below the poverty level is 7.5%, and the average percentage of population with incomes of $15,000 or more is 16.9%.[15] The 1970 income characteristics of the three counties in which Study Area 1 is located are summarized in Table 9.

Table 10 gives the estimated per capita income for Yates and Steuben Counties and their subdivisions for the years 1969 and 1974.

4.3 Land Use

4.3.1 Recreational, Natural, Archaeological, and Historical Areas

As shown in Figure 19, there are several state forest areas within or in proximity to the study area, mostly located to the southeast.[16]

Bluff Point State Park, the only state park within or in close proximity to the study area, is located near the northeastern part of the area at the northern end of the western "finger" of Keuka Lake[11] (Figure 19).

A wildlife management area is located in the vicinity of Naples, a small urban center located north and west of the study area.

The extent of historical and archaeological places in the study area has not been determined.

4.3.2 Potentially Interactive Uses

Airports

There are no major airports within the study area or in close proximity. Several small airports are scattered throughout the area (Figure 20).

Nuclear Power Plants

There are no nuclear power plants within Study Area 1. The closest nuclear power plant is the Robert E. Ginna Plant, which is about 50 miles north-northwest of the study area on the south shore of Lake Ontario.

Military Bases

There are no military bases within Study Area 1. The closest military facility of significant size is the 10,587-acre Seneca Army Depot near Seneca, New York. This army depot is northeast of the study area across Seneca Lake.

TABLE 7

MAJOR INDUSTRY EMPLOYMENT
FOR 4-COUNTY STUDY AREA
NEW YORK STUDY AREA 1[9]

Industry	Number of Employees	Percent total
Agricultural Services, Forestry, Fisheries	20-137	0%-.3%
Mining	220-597	.5%-1.3%
Contract Construction	1,337	3.0%
Manufacturing	19,085	42.5%
Transportation and Other Public Utilities	2,369	5.3%
Wholesale Trade	2,056	4.6%
Retail Trade	10,034	22.3%
Finance, Insurance & Real Estate	1,395-1,548	3.1%-3.4%
Services	8,039	17.9%
Non-classifiable	217-366	.5%-.8%

TABLE 8

COUNTY EMPLOYEES AND PAYROLL
BY MAJOR INDUSTRY FOR 1975
NEW YORK STUDY AREA 1[9]

COUNTY/Industry	Number of Employees For Selected Week	Annual Payroll ($1000)
YATES		
Agricultural services, forestry, fisheries	0-19	NA
Mining	100-249	NA
Contract Construction	110	1,301
Manufacturing	738	7,370
Transportation and other public utilities	560	8,325
Wholesale trade	226	1,875
Retail trade	670	3,833
Finance insurance, and real estate	100-249	NA
Services	686	5,269
Non-classifiable establishments	22	158
TOTAL	3,307	31,371
STEUBAN		
Agricultural services, forestry, fisheries	0-19	NA
Mining	100-249	NA
Contract Construction	498	6,715
Manufacturing	14,155	156,736
Transportation and other public utilities	780	8,612

Wholesale trade	842	7,182
Retail trade	4,136	24,869
Finance, insurance, and real estate	773	6,530
Services	3,415	23,673
Non-classifiable establishments	100-249	NA
TOTAL	24,836	236,383
ONTARIO		
Agricultural services, forestry, fisheries	20-99	NA
Mining	20-99	NA
Contract Construction	729	9,768
Manufacturing	4,192	43,344
Transportation and other public utilities	1,029	12,612
Wholesale trade	988	10,197
Retail trade	5,228	31,097
Finance, insurance, and real estate	522	4,645
Services	3,938	29,992
Non-classifiable establishments	95	751
TOTAL	16,779	143,223

NA Not available

TABLE 9
1970 INCOME CHARACTERISTICS
NEW YORK STUDY AREA 1 (15)

Income Characteristics	Ontario County	Steuben County	Yates County	Average
Median Income	$ 10,511	$ 9,082	$ 9,068	$ 9,554
Mean Income	11,184	9,949	9,881	10,338
Percent of Population Income Less Than Poverty Level	6.4%	7.9%	8.3%	7.5%
Percent of Population With Income $15,000 Or More	20.5%	15.9%	14.4%	16.

TABLE 10

ESTIMATED PER CAPITA INCOME

NEW YORK STUDY AREA 1[8]

COUNTY/Subdivision	1974	1969	Percent Change 1969 to 1974
YATES COUNTY	$ 3,799	$ 2,773	37.0
Italy (T)	2,792	1,974	41.4
Jerusalem (T)	3,995	2,793	43.0
STEUBAN COUNTY	3,922	2,763	41.9
Prattsburg (T)	3,773	2,664	41.6
Prattsburg (C)	NA	NA	NA
Conocton (T)	4,389	2,932	49.7
Cohocton (C)	4,537	2,958	53.4
Wayland (T)	3,527	2,708	30.2
Avoca (T)	3,764	2,626	43.3
Avoca (C)	3,709	2,583	43.6
Wheeler (T)	3,242	2,266	43.1
Urbana (T)	3,821	2,960	29.1

NA Not Available

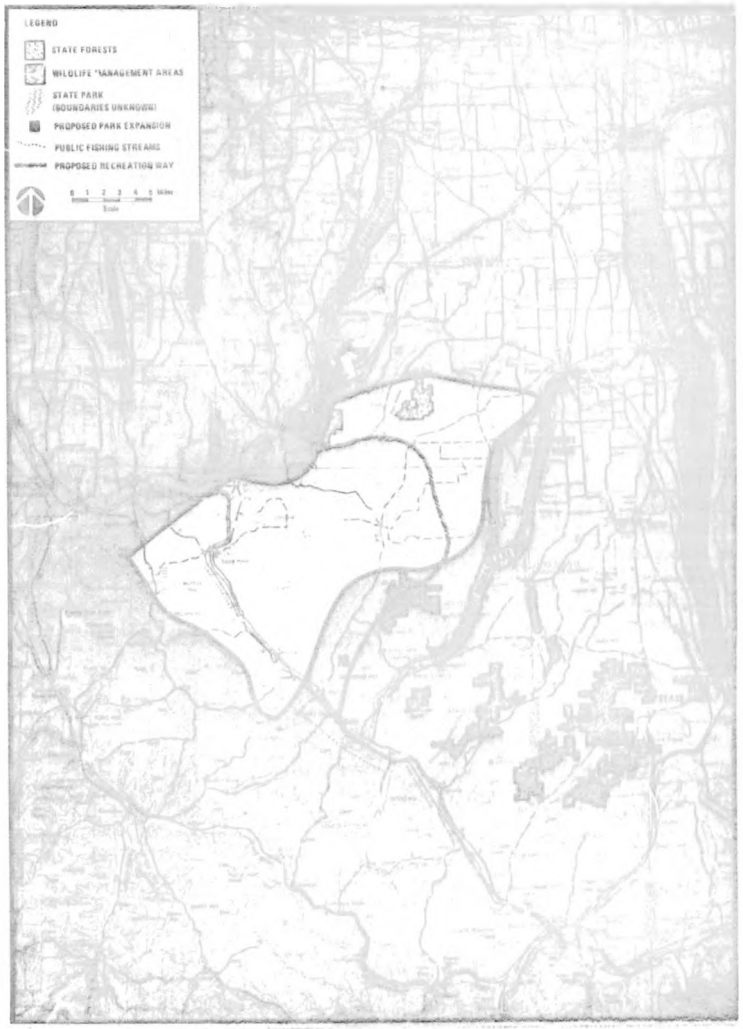


FIGURE 19 RECREATIONAL, NATURAL AND OTHER AREAS – NEW YORK STUDY AREA 1

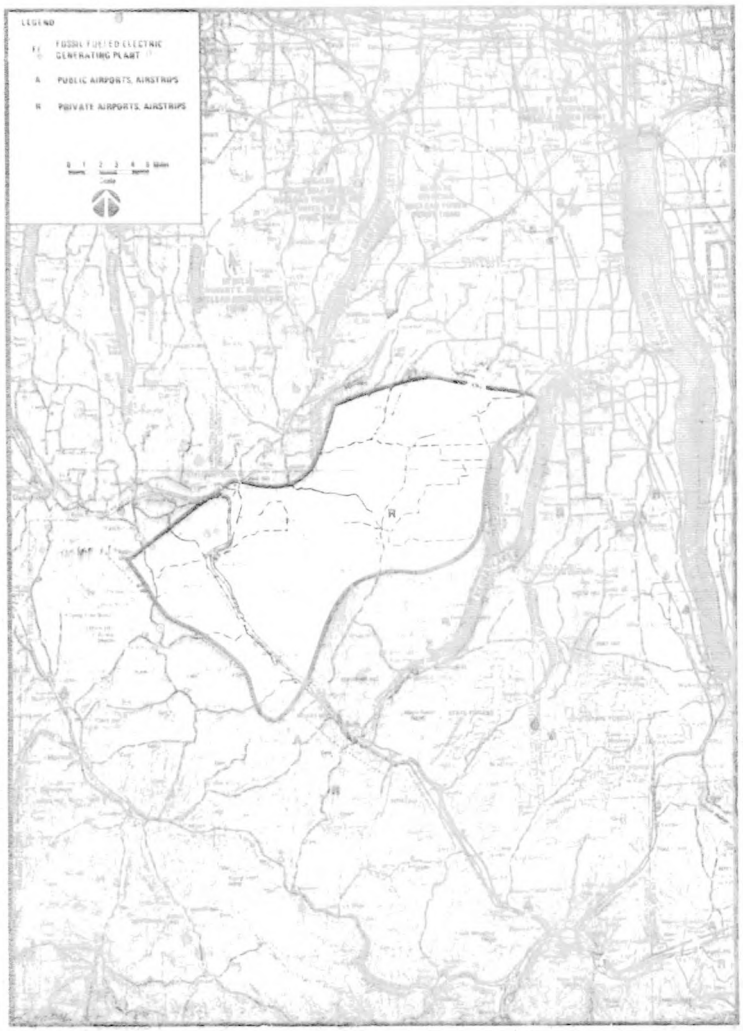


FIGURE 20 POTENTIALLY INTERACTIVE USES – NEW YORK STUDY AREA 1

Large Fossil-Fired Plants

There are no large fossil-fired plants within the study area, but two plants are located nearby in East Corning and Dresden. Both are owned by the New York State Electric & Gas Corporation (NYSEG). The Dresden plant is a coal-fired electricity-generating facility with a steam-turbine generating capacity of 170,000 kilowatts. The East Corning plant is also coal-fired and has a steam-turbine generating capacity of 70,000 kilowatts. A hydroturbine generating facility owned by NYSEG is located in Seneca Falls, northeast of the study area, and has a generating capacity of 8,000 kilowatts.

Concentrations of Potentially Interactive Uses

No information available.

4.4 Transportation Systems

4.4.1 Highways

State Route 17, a principal divided highway, skirts the south-southwestern portion of the study area. A future alignment of this highway will traverse the southwestern part of the study area. One U.S. Highway, Route 15, extends into the study area from the north from Wayland to Bath. There are several other connectors and local roads of significance in the study area (Figure 21).

4.4.2 Railroads

Conrail operates two lines in and adjacent to the study area. One stretches from Corning to Bath to Wayland, New York, and extends through the southwestern portion of the study subarea. The other operates from Corning in a northerly direction to Penn Yan and northward. This and other nearby railroad lines along Seneca Lake are not within the study area. Figure 22 shows the location of these railroad lines in and around the study area.

4.4.3 Navigable Waterways

There are no waterways used for commerce in the study area.

Major Ports

There are no major ports in the study area.

4.5 Indian Reservations

There are no Federal Indian Reservations in or in close proximity to the study area.

4.6 Land Use Patterns

The study area is located on the hilly Allegheny plateau, which extends across the southwestern reaches of New York State. Dairy farming is the principal use of farming land in the area. There is also a substantial grape-growing and wine-producing industry in the study area, particularly along the shores of Keuka Lake.

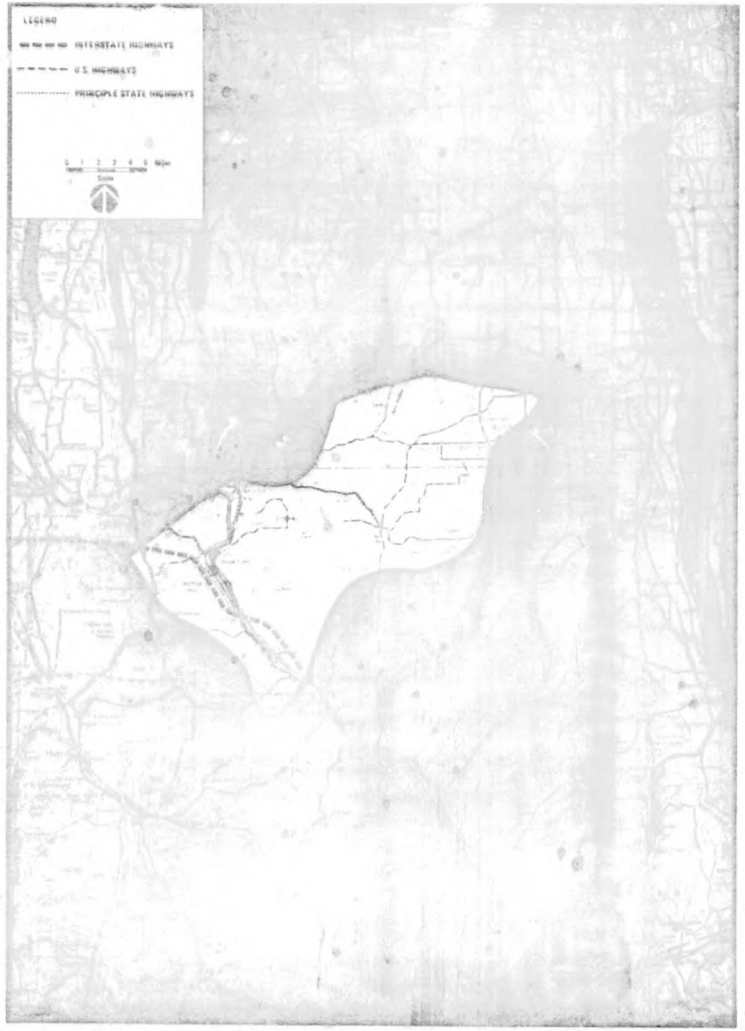


FIGURE 21 TRANSPORTATION SYSTEMS – HIGHWAYS – NEW YORK STUDY AREA 1

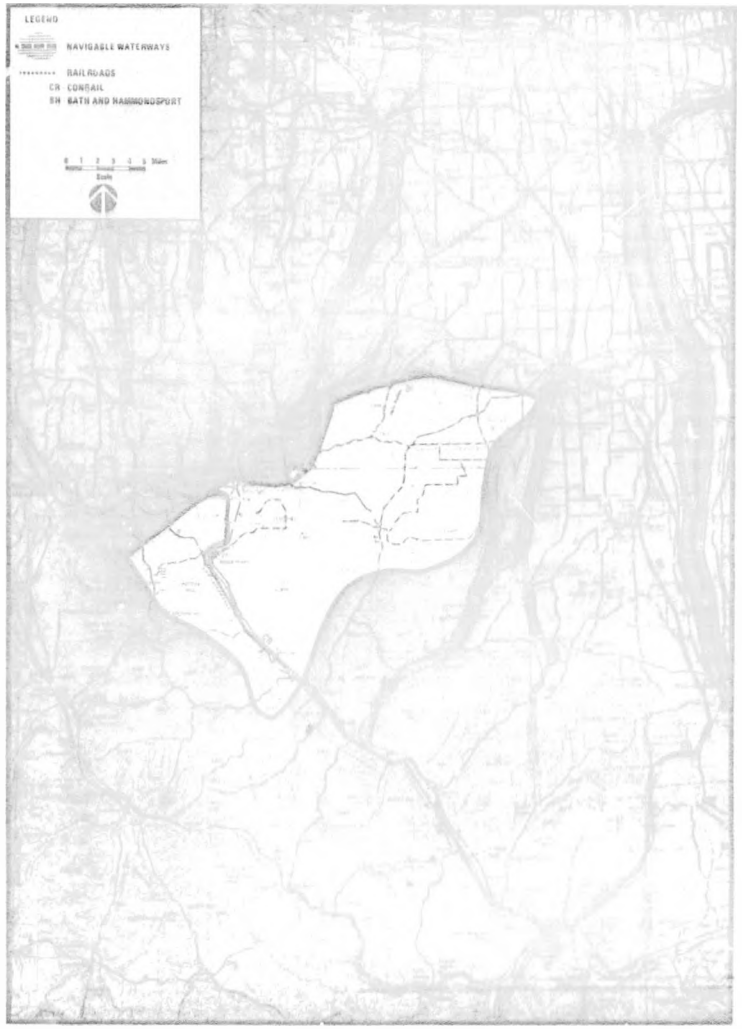


FIGURE 22 TRANSPORTATION SYSTEMS – RAILWAYS, WATERWAYS – NEW YORK STUDY AREA 1

4.7 Surface-Water Resources

Figure 23 shows the surface water drainage features of Study Area 1 in south central New York. As shown, the lower part of the study area is drained by the Cohocton River and its tributaries, including Twelvemile Creek and Fivemile Creek. The headwaters area of Flint Creek, flowing in a general south-to-north direction, drains the northern end of the study area. A small portion of the study area belongs to the drainage basin of Keuka Lake.

Surface water sources account for about 33 percent of the water use in the general area of New York Study Areas 1 and 2. The average surface-water demands in and near Study Area 1 are as follows:[6] Steuben County, 3.1 MGD, and Yates County, 0.2 MGD.

4.8 Ground Water Resources

Sand and gravel beds within the unconsolidated sediments are the most permeable portion and form the principal aquifers. Water infiltrates into the ground-water aquifers wherever the soil is sufficiently permeable. This ground-water is derived directly from precipitation or indirectly from surface bodies of water. Ground-water availability in Study Area 1 is shown in Figure 24 which indicates that the major productive aquifers are located mainly in the alluvial valleys of perennial streams. These aquifers are replenished by recharge from the overlying watercourse.[6]

Public water supplies in New York Study Areas 1 and 2 are heavily dependent on ground-water, with about 61 percent of the water used for public supply derived from wells. The average ground-water withdrawal[6] of 12.3 MGD in Steuben County and 2.4 MGD in Yates County may be representative of the ground-water usage in Study Area 1.

4.9 Preliminary Environmental Assessment

Figure 25 is a composite representation of the environmental data collected for New York Study Area 1. The portions of Steuben and Yates Counties that have been recommended for further study[6] are rural in nature, with only three small communities that have populations ranging from 765 to 1229 inhabitants. The study area is essentially free of recreational or natural areas, major airports, and other possible interactive uses of land. Both highway and railway access is readily available from the south-southwestern portions of the study area. With a low population in the area, surface- and ground-water usage are low. While there is substantial wine producing industry in the area, more information is needed on the extent of this land use, and other agricultural activities before any substantive evaluation can be made.

A preliminary environmental assessment indicates that the western half of Wheeler Township, the central and western portions of Prattsburg Township, and most of Jerusalem and Pulteney Townships would be suitable for further exploration in the next phase of the program.

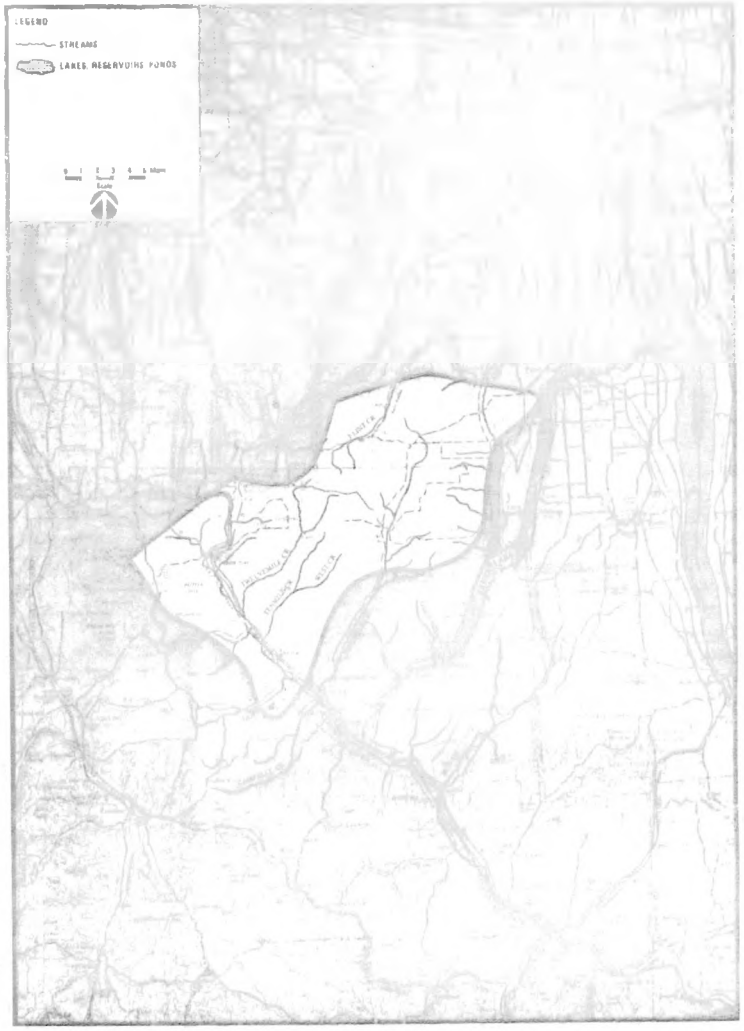


FIGURE 23 SURFACE WATER DRAINAGE FEATURES IN SOUTH CENTRAL NEW YORK (STUDY AREA 1)

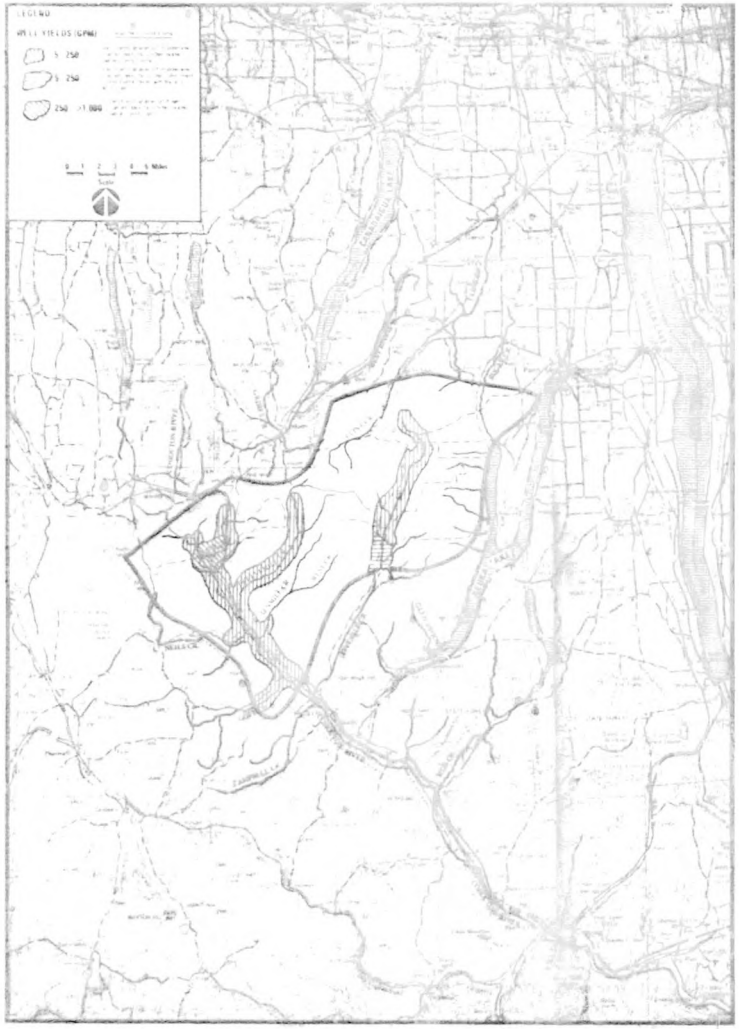


FIGURE 24 GROUND WATER AVAILABILITY IN SOUTH CENTRAL NEW YORK (STUDY AREA 1)

FIGURE 25 NEW YORK STUDY AREA 1 COMPOSITE

5. EVALUATION OF NEW YORK STUDY AREA 2

Stone & Webster has recommended several parts of south central New York as favorable for further exploration.[6] Two of these subareas, one between Seneca and Cayuga Lakes and the other covering parts of Tompkins, Cayuga, and Cortland Counties, have been aggregated into Study Area 2. This section presents environmental data for Study Area 2.

5.1 Demography

5.1.1 Population Centers and Urbanized Areas

There are several urban areas that are scattered throughout the two-part Study Area 2. The principal urban center within the study area is Cortland, a city of 19,621 inhabitants, as reported in the 1970 Census. Its 1975 estimated population was 20,505 inhabitants. In addition, the study area contains six towns with populations ranging between 1,000 and 5,000 inhabitants: Moravia, Homer, Munsons Corners, Dryden, and Groton. As shown in Figure 26, all of these towns are east of Cayuga Lake. Trumansburg is the only urban center in the study area west of Cayuga Lake. The City of Ithaca, which lies between the eastern and western parts of the study area, is the principal urban center in the surrounding area. According to the U.S. Bureau of the Census,[8] its 1970 population was 26,226 inhabitants and its 1975 estimated population was 28,770.

5.1.2 Population Density

Table 11 contains population density breakdowns by subdivision for the following five counties: Seneca, Tompkins, Cayuga, Schuyler, and Cortland.

Figure 27 shows the population density and supplements the urban area data of Figure 26. It also indicates the minor civil divisions within or adjacent to Study Area 2. The population densities of the minor civil divisions for which data are available range from a high of 5,257 to a low of 21 persons per square mile.[8,14] The southeastern and southwestern portions of the study area are generally less inhabited than other areas.

5.2 Socioeconomics

Economic data were generated to further illustrate the basic characteristics of each area and to support the land use and population information. The economic data, of itself, however, does not provide any further estimation of environmental suitability between the four areas.

5.2.1 Economic Base

Within the five counties covered by Study Area 2, the primary employment sector is manufacturing, accounting for 23,044 employees. Retail trade and services are the next most important employment categories, with 11,408 and 14,753 employees respectively.[9] The number of employees in the principal industries is given in Table 12, which also indicates the percentages of total employment for each major employment category.

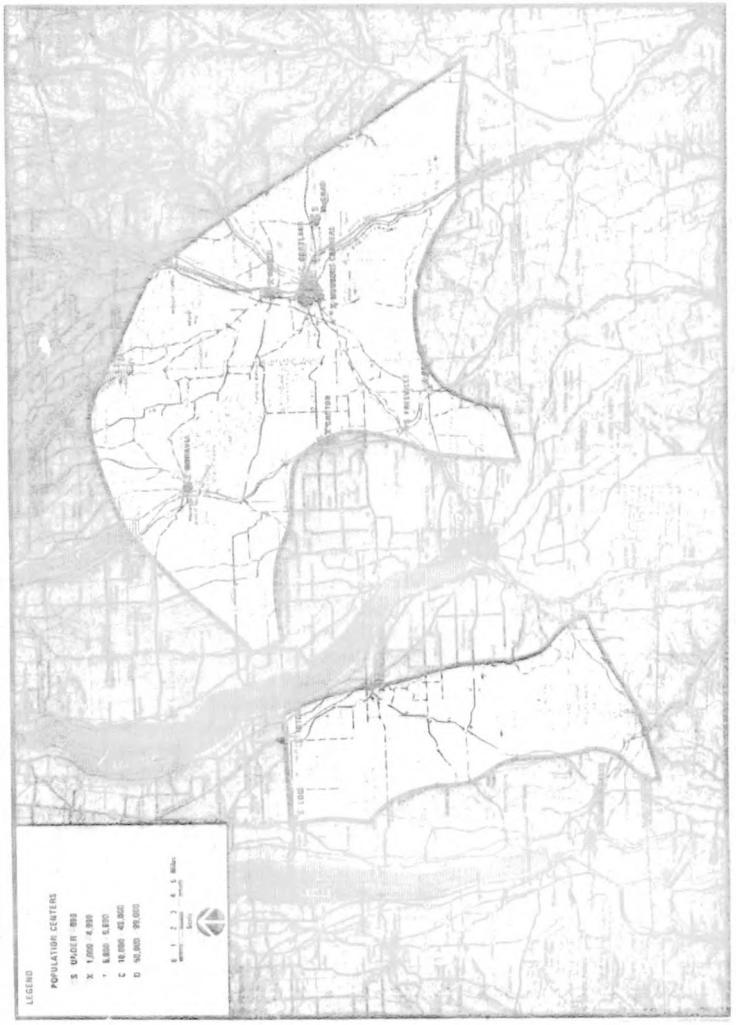


FIGURE 26 POPULATION CENTERS AND URBANIZED AREAS – NEW YORK STUDY AREA 2

TABLE 11
1975 POPULATION ESTIMATES AND POPULATION
DENSITIES BY COUNTIES AND SUBDIVISIONS
NEW YORK STUDY AREA 2[8,14]

COUNTY/Subdivision	July 1, 1975 Population	Area, mi^2	Population Density (Persons/$mile^2$)
SENECA COUNTY	34,036	330	103.1
Lodi (T)	1,257	NA	NA
Covert (T)	2,197	NA	NA
Lodi (C)	325	NA	NA
Interlaken (V)	766	NA	NA
CAYUGA COUNTY	77,833	698.0	111.5
Venice (T)	1,274	41.1	30.9
Moravia (T)	2,644	29.1	90.8
Moravia (C)	1,591	1.7	935.8
Sempronius (T)	677	29.4	23.0
Summerhill (T)	737	26.0	28.3
Locke (T)	1,313	24.7	53.1
Genoa (T)	1,752	39.5	44.3
TOMPKINS COUNTY	83,699	482.0	173.5
Lansing (T)	6,858	69.2	99.1
Groton (T)	5,205	NA	NA
Groton (C)	2,310	NA	NA
Ulysses (T)	4,538	33.4	135.8
Trumansburg (C)	1,883	NA	NA
Enfield (T)	2,049	37.4	54.7
Newfield (T)	2,198	55.0	39.9
Caroline (T)	2,717	55.4	49.0
Dryden (T)	10,724	94.9	113.0
Dryden (C)	1,624	NA	NA
Freeville (C)	692	NA	NA

SCHUYLER COUNTY	17,823	330.0	54.0
Hector (T)	4,068	NA	NA
Burdette (C)	479	NA	NA
Watkins Glen (C)	2,657	NA	NA
Catharine (T)	2,084	NA	NA
Odessa (C)	678	NA	NA
Cayuta (T)	629	NA	NA
CORTLAND COUNTY	47,804	502.0	95.2
Scott (T)	894	21.6	41.3
Preble (T)	1,702	27.8	61.2
Homer (T)	6,981	51.2	136.3
Homer (V)[3]	4,415	1.5	2,943.3
Cortlandville (T)	7,631	49.5	154.1
Cortland (C)	20,305	3.9	5,257.6
McGraw (V)	1,327	1.0	1,327.0
Munsons Corners (U)	NA	NA	NA
Solon (T)	696	30.0	23.2
Virgil (T)	1,705	47.9	35.5
Freetown (T)	548	25.8	21.2
Cincinnatus (T)	1,120	25.6	43.7
Willet (T)	619	26.2	23.6
Marathon (T)	1,844	24.6	74.9
Marathon (C)	1,063	1.1	966.3
Lapeer (T)	539	25.1	21.4

(C) City
(T) Town (township)
(V) Village
(U) Unincorporated place

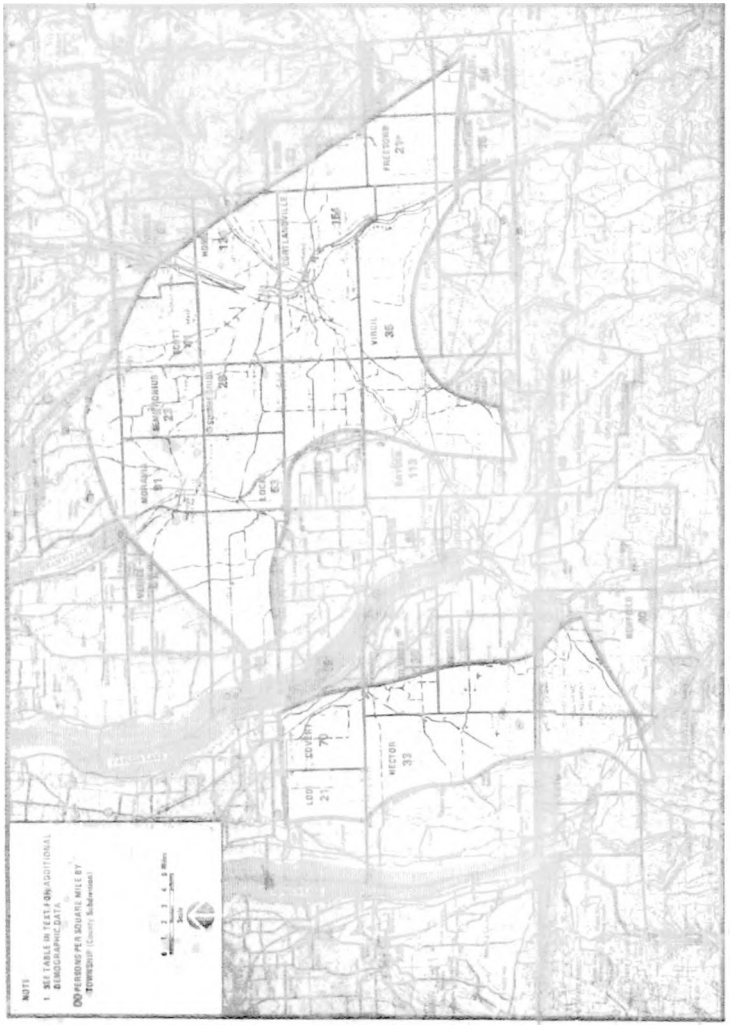


FIGURE 27 PERSONS PER SQUARE MILE BY SUBCOUNTY AREAS - NEW YORK STUDY AREA 2

TABLE 12

MAJOR INDUSTRY EMPLOYMENT

FOR 5-COUNTY NEW YORK STUDY AREA 2[9]

Industry	Number of Employees	Percent of Total
Agricultural Services, Forestry Fisheries	91-267	0.4%
Mining	40-306	0.5%
Contract Construction	1,942	3%
Manufacturing	23,044	39%
Transportation and other public utilities	2,290	3.8%
Wholesale trade	2,833	4.8%
Retail trade	11,408	19.3%
Finance, insurance and real estate	2,225	3.7%
Services	14,753	24.9%
Non-classifiable	258-356	.4-.6%

5.2 Mean Per Capita Income

The per capita income in 1970 averaged $2,802 for all the counties in this study area.

In 1970, the mean family incomes for Seneca, Tompkins, Cayuga, Schuyler, and Cortland Counties were $10,262, $11,662, $10,050, $9,450 and $[illegible], respectively. The average for the five counties was $10,315. The percentages of population with income below the poverty level for the five counties in 1970 were as follows:[15] Seneca, 7.6%; Tompkins, 5.6%; Cayuga, 8.4%; Schuyler, 8.8%; and Cortland, 8.5%.

Table 13 gives the estimated per capita income for all five counties and their subdivisions for the years 1969 and 1974.

5.3 Land Use

5.3.1 Recreational, Natural, Archaeological, and Historical Areas

There are many state forest areas located in and around the study area. As shown in Figure 28, most of these lands are concentrated in the eastern and southeastern sections of the area.[16]

The Connecticut Hill Game Management Area is located in the southern portion of the western sector of the study area (Figure 28).

Fillmore Glen State Park is southeast of Moravia in the eastern sector.[11]

Complete information for all places at the state and local level has not been available.

Historic Places

Three historic places and a historic district within the study area are recognized in the National Register of Historic Places. The historic district and two other sites are within the Cortland area, as shown on Figure 29. The remaining historic site is in Trumansburg, which is west of Cayuga Lake.[12]

Archaeological Sites

No information is available at this time.

5.3.2 Potentially Interactive Uses

Nuclear Power Plants

There are no nuclear power plants within the study area. The nearest operating nuclear plant is the Robert E. Ginna Plant, which is approximately 70 miles northwest of the study area. The proposed Sterling Nuclear Plant site is also about 70 miles distant to the north-northeast.

Large Fossil-Fired Plants

The Milliken Power Plant, a fossil-fired facility, is located on the eastern shore of Cayuga Lake between the two parts of the study area.

TABLE 13

ESTIMATED PER CAPITA INCOME
NEW YORK STUDY AREA 2[8]

COUNTY/Subdivision	1974	1969	Percent Change 1969 to 1974
SENECA COUNTY			
Lodi (T)	$ 3,626	$ 2,691	39.1
Covert (T)	4,032	2,863	40.8
Lodi (C)	3,597	2,607	38.0
Interlaken (V)	4,204	3,042	38.2
CAYUGA COUNTY			
Venice (T)	3,783	2,676	41.4
Moravia (T)	3,854	2,797	37.8
Moravia (C)	3,964	2,958	34.0
Sempronius (T)	2,862	2,103	36.1
Summerhill (T)	3,584	2,473	44.9
Locke (T)	2,802	2,004	39.8
Genoa (T)	3,429	2,425	41.4
TOMPKINS COUNTY			
Lansing (T)	4,699	3,442	36.5
Groton (T)	3,687	2,647	39.3
Groton (C)	4,204	3,097	35.7
Ulysses (T)	4,334	3,046	42.3
Trumansburg (C)	4,094	2,859	43.2
Enfield (T)	3,787	2,771	36.7
Newfield (T)	4,203	2,906	44.6
Caroline (T)	3,956	2,834	39.6
Dryden (T)	4,283	3,175	34.9
Dryden (C)	3,542	2,633	34.5
Freeville (C)	3,351	2,498	34.1

SCHUYLER COUNTY			
Hector (T)	3,249	2,325	39.7
Burdette (C)	3,293	2,449	34.5
Watkins Glen (C)	4,246	3,276	29.6
Catharine (T)	3,287	2,438	34.8
Odessa (C)	4,193	2,862	46.5
Cayuta (T)	3,448	2,485	38.8
CORTLAND COUNTY			
Scott (T)	3,902	2,764	41.2
Preble (T)	3,915	2,695	45.3
Homer (T)	4,071	2,978	36.7
Homer (V)	4,147	2,996	38.4
Cortlandville (T)	4,046	3,046	32.8
Cortland (C)	3,867	2,762	40.0
McGraw (V)	3,734	2,820	32.4
Solon (T)	3,406	2,356	44.6
Virgil (T)	3,509	2,512	39.7
Freetown (T)	2,342	1,891	23.8
Cincinnatus (T)	4,142	2,852	45.2
Willet (T)	2,610	2,014	29.6
Marathon (T)	3,558	2,501	42.3
Marathon (C)	3,700	2,645	39.9
Lapeer (T)	3,050	2,228	36.9

(C) City
(T) Town (township)
(V) Village

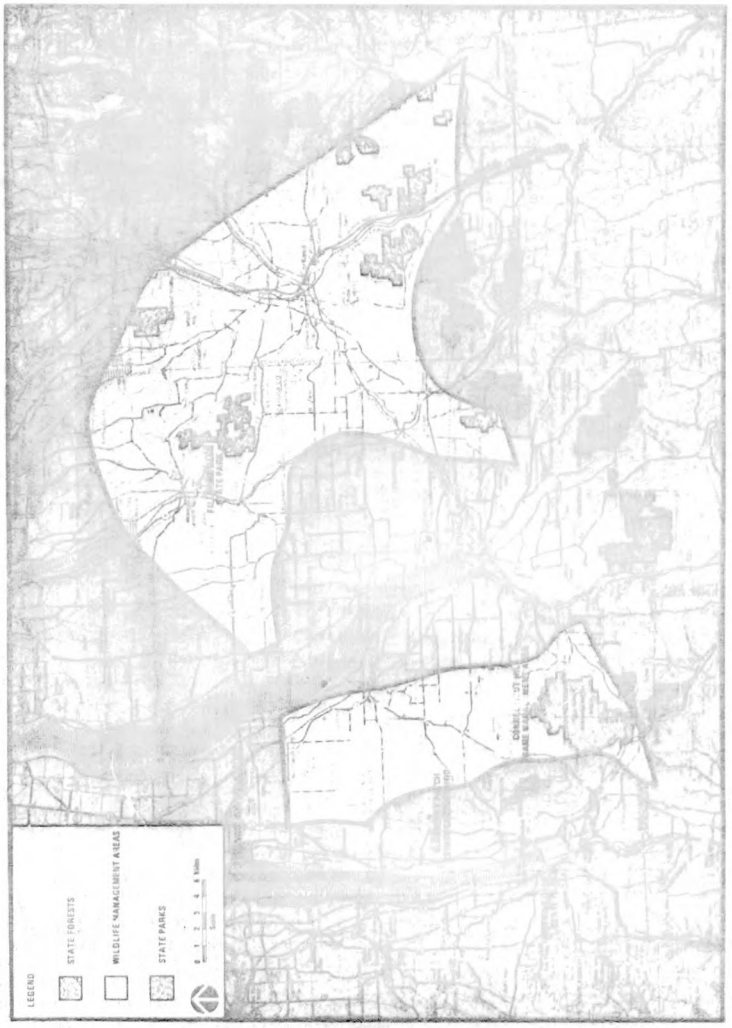


FIGURE 28 RECREATIONAL, NATURAL AND OTHER AREAS - NEW YORK STUDY AREA 2

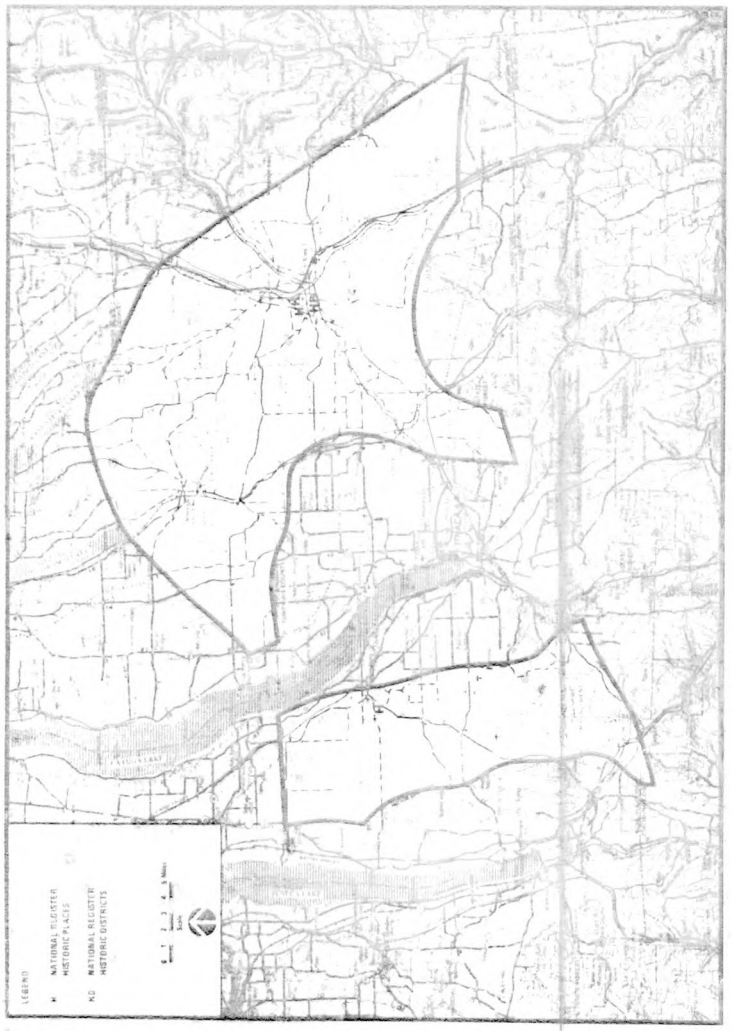


FIGURE 29 HISTORIC PLACES AND ARCHEOLOGICAL SITES – NEW YORK STUDY AREA 2

Airports

Many small airports and airstrips, public and private, are located in the area (Figure 30).

Military Bases

The Seneca Army Depot is northwest of the area. The extent of activities at Seneca and other places has not been determined for this report.

Concentrations of Potentially Interactive Uses

Major concentrations of potentially interactive uses have not been identified.

5.4 Transportation Systems

5.4.1 Highways

Interstate 81, a major northwest thoroughfare, extends through the eastern section of the study area. It runs south to Binghamton and north to Syracuse, passing through Cortland, which is in the northeastern portion of the study area. U.S. Route 11, an older U.S. highway, runs parallel to Interstate 81.

Principal state and local connecting highways include Routes 13, 96 and 34. Other principal roads of the region and local roads are shown in Figure 31.

5.4.2 Railroads

Several lines, all operated by Conrail extend in and around Study Area 2. Principal lines extend from Ithaca to the south and from Ithaca northeast to Cortland and then north to Syracuse. Other principal lines are located along both sides of Seneca Lake, west of the study area (Figure 32).

5.5 Indian Reservations

There are no Federal Indian Reservations within the study area. The Onondaga Indian Reservation is about 8 miles northeast of the area.

5.6 Land Use Patterns

Figure 33 shows the major land system elements in the study area. Detailed information on the agricultural viability of the land is not available at present, but there is much agricultural activity in the area. The largest single land use in the area is agriculture.

The study area is located on the hilly Allegheny Plateau, which extends across the southwestern reaches of New York State. Important activities in the Finger Lakes Area include dairying, wheat growing, and viniculture.

Detailed agricultural data were available for Tompkins County only and are shown on Figure 33.

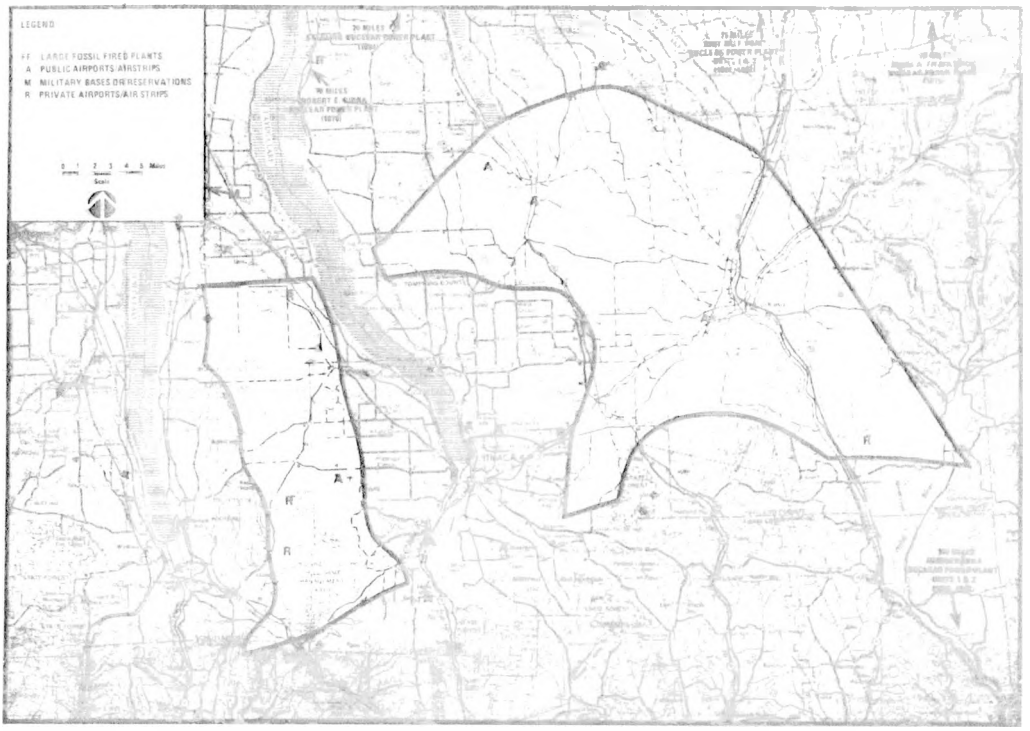


FIGURE 30 POTENTIALLY INTERACTIVE USES – NEW YORK STUDY AREA 2

FIGURE 31 TRANSPORTATION SYSTEMS – HIGHWAYS – NEW YORK STUDY AREA 2

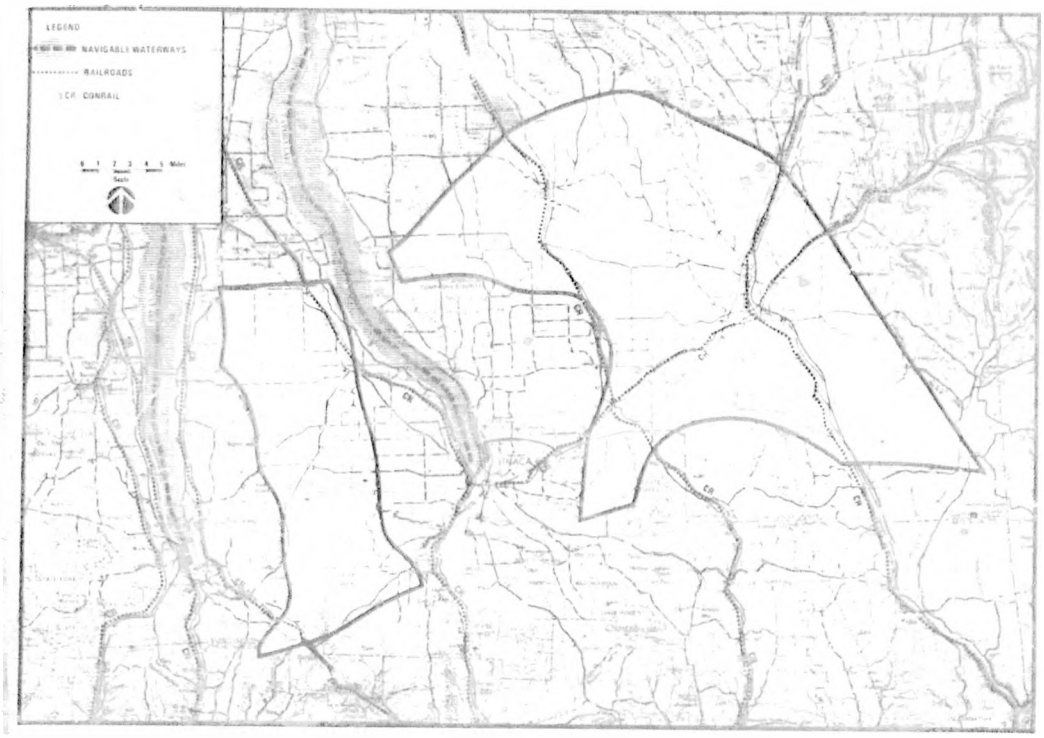


FIGURE 32 TRANSPORTATION SYSTEMS – RAILWAYS, WATER WAYS – NEW YORK STUDY AREA 2

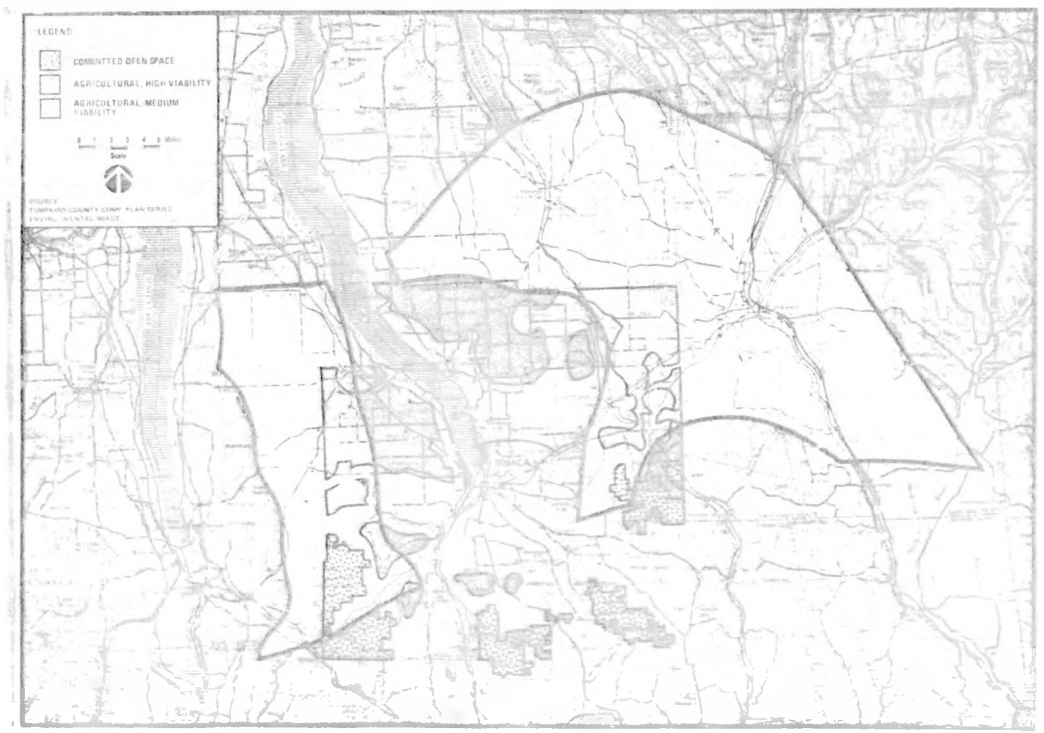


FIGURE 33 LAND USE PATTERNS – NEW YORK STUDY AREA 2

5.7 Surface Water Resources

The surface-water drainage features of Study Area 2 are presented in Figure 34. Most of the study area is drained by tributaries of the Finger Lakes which flow in a south-to-north direction and empty into Lake Ontario. The east end of Study Area 2 is drained by the Tioughnioga River, a tributary of the Susquehanna River.

Surface-water sources account for about 33 percent of the total water use in the general area of New York Study Areas 1 and 2. In Study Area 2, average surface-water uses by county basis are as follows:[6] Cortland, 0.4 MGD, Schuyler, 0.7 MGD, Seneca, 2.4 MGD, Cayuga, 11.8 MGD, and Tompkins, 11.2 MGD.

5.8 Ground Water Resources

Sand and gravel beds within the unconsolidated sediments are the most permeable portion and form the principal aquifers. Water infiltrates into the ground-water aquifers wherever the soil is sufficiently permeable. This ground water is derived directly from precipitation or indirectly from surface bodies of water. Ground-water availability in Study Area 2 is presented in Figure 35. As shown, major productive aquifers are located mainly in the alluvial valleys of perennial streams. These ground-water sources are recharged by the overlying watercourse.[4]

Public water supplies in the New York Study Areas 1 and 2 are heavily dependent on ground-water, with about 61 percent of the water used for public supply derived from wells. The ground-water use in Study Area 2 may be approximated by the ground-water withdrawal of the following counties: Cortland, 3.6MGD, Tompkins, 5.0 MGD, Cayuga, 3.7 MGD, Seneca, 2.5 MGD, and Schuyler, 2.1 MGD.

5.9 Preliminary Environmental Assessment

Figure 36 is a composite of the environmental information collected for New York Study Area 2. The principal urban center is Cortland, with a 1975 estimated population of 20,505 inhabitants; in addition, there are six towns with populations ranging between 1,000 and 5,000 inhabitants. From a recreational viewpoint, there are many state forests, a game management area, and a state park in and around the study area. Three historic places and a historic district are located in the study area; the district and two of the sites are within the Cortland area. Major concentrations of potentially interactive land uses have not been identified. One interstate and several state and local connecting highways, as well as several rail lines, provide good transport accessibility. Most of the study area is drained by tributaries of the Finger Lakes. About 61 percent of the public water supplies in the New York Study Areas 1 and 2 is derived from ground-water sources. More detailed information on the agricultural viability of the land is needed, as the largest single land use in the area is agricultural; these activities in the Finger Lakes area include dairying, wheat growing and viniculture.

The preliminary environmental assessment indicates that parts of the northern sections of both subareas, as well as sections of Freetown and Virgil Townships in the eastern subarea, are favorable for further investigation in the next phase of the program.

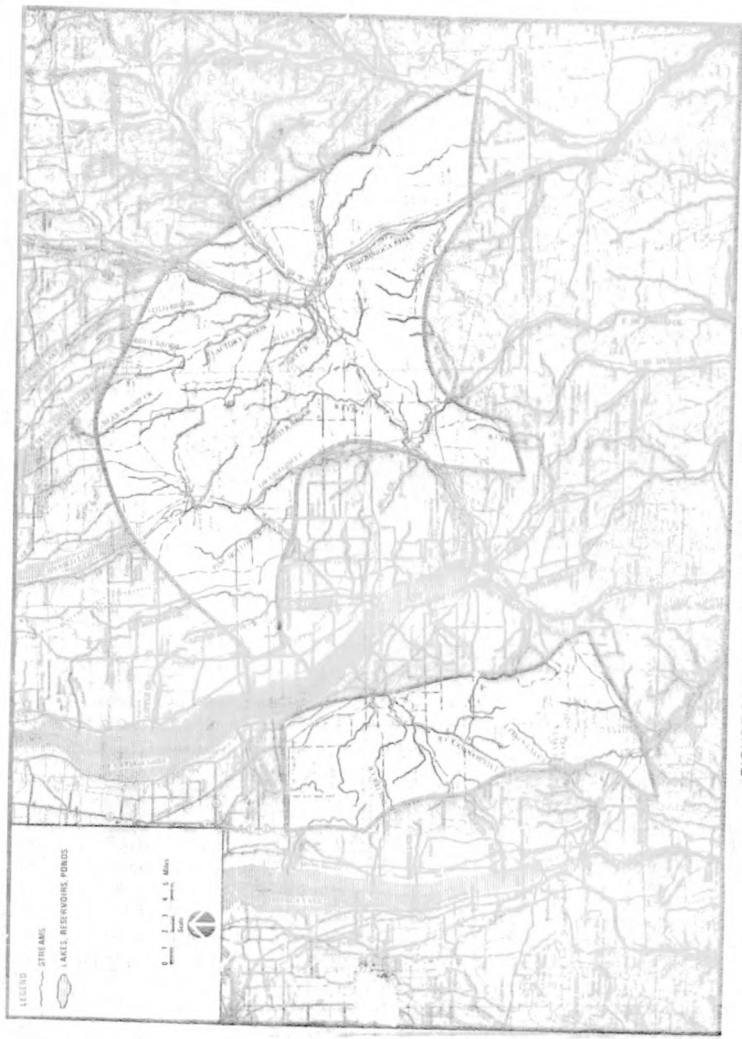


FIGURE 34 SURFACE WATER DRAINAGE FEATURES IN SOUTH CENTRAL NEW YORK STUDY AREA 2

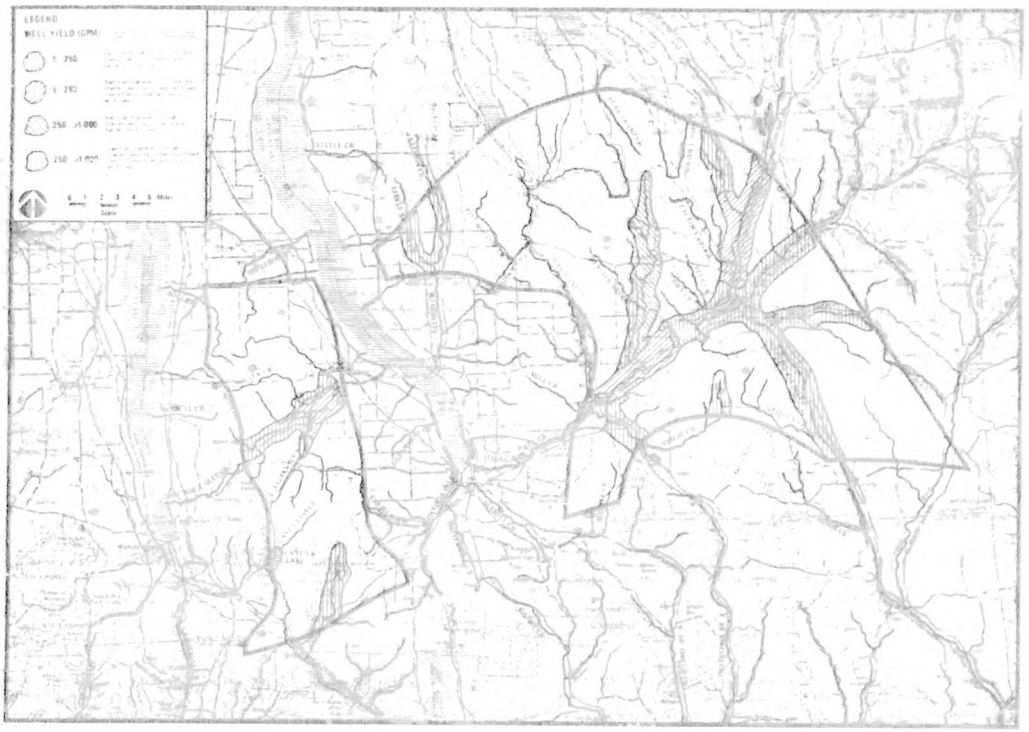


FIGURE 35 GROUND WATER AVAILABILITY IN SOUTH CENTRAL NEW YORK STUDY AREA 2

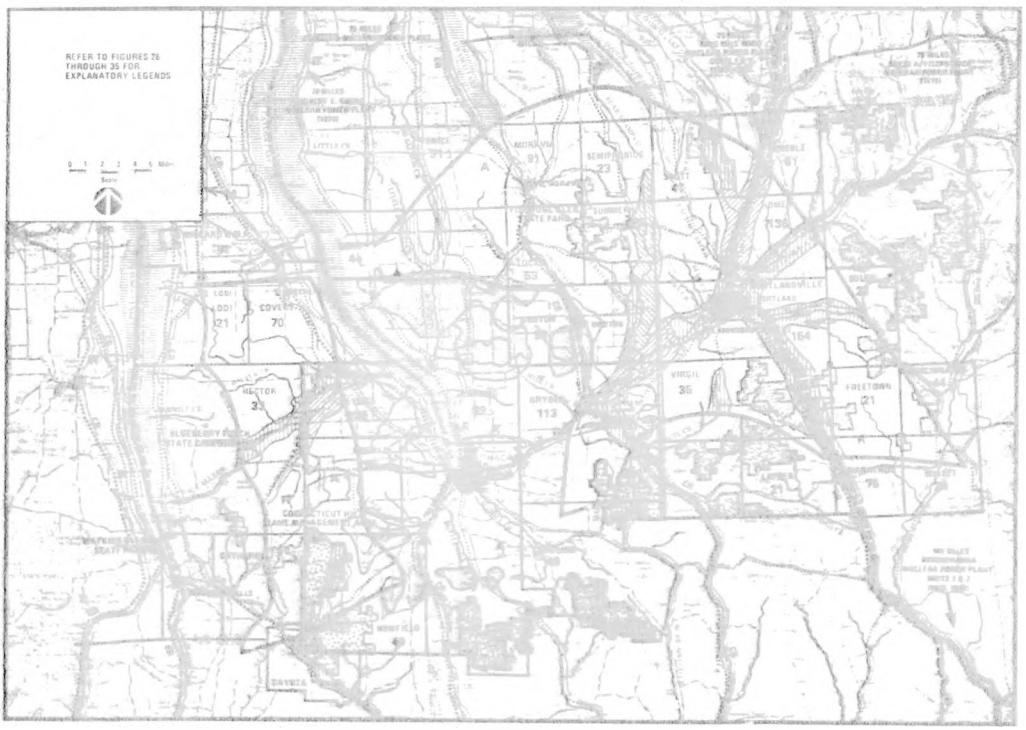


FIGURE 36 NEW YORK STUDY AREA 2 COMPOSITE

6. SUPPLEMENTAL DATA FOR THE BEAVER DAMS, NEW YORK SUBAREA

In the later phases of the geologic screening of south central New York, a small, horseshoe-shaped area near Beaver Dams and southwest of Watkins Glen (Figure 6) was recommended for further investigation.[6] The location meets the basic geologic requirements but because of its small size was not included in the initial environmental characterization. This section presents supplemental data for this subarea.

6.1 Demography

The area includes land in Chemung and Schuyler Counties and is directly adjacent to Steuben County. There are no urban areas in the area nor are there any principal population centers. The nearest concentrated population is in the Village of Montour Falls, approximately 7 miles northeast of Beaver Dams. The 1975 estimated population of Montour Falls was 1,535 inhabitants.[8] Corning and Painted Post, with a combined 1975 population of 17,037, lie about 12 miles southwest of the area. Elmira, with a 1975 estimated population of 37,220, and the adjacent cities of Elmira Heights and Horseheads are about 14 miles southeast of the study area. This is the nearest large urban concentration, with a total estimated 1975 population of 50,392 in the three cities.

6.1.1 Population Density

The population density for the area is shown in Table 14. The densities for the minor civil divisions (towns) range from a high of 115 to a low of 22 persons per square mile. The overall average density for the area is approximately 61 persons per square mile. In population density this area differs little from Study Area 1.

6.2 Socioeconomics

Economic data were generated to further illustrate the basic characteristics of each area and to support the land use and population information. The economic data, of itself, however, does not provide any further estimation of environmental suitability between the four areas.

6.2.1 Economic Base

Most of the Beaver Dams area is in Schuyler County, whose economic base is discussed in Section 5. Steuben County, which is adjacent to a small part of the Beaver Dams area, is discussed in Section 4. A small part of the Beaver Dams area lies in Chemung County. The employment profile for Chemung is similar to those of surrounding areas; the primary employment category is manufacturing, followed by retail trade and services. Table 15 provides further economic information.

6.2.2 Income

The mean family income for Chemung County was $10,270 in 1970. This is slightly lower than the average in the other New York study areas. The percentage of families with incomes below the poverty level is slightly higher at 8.5%. The 1970 income characteristics[15] for Chemung County are as follows:

Table 14

Population Density For Beaver Dams Subarea[8]

County/Subdivision	July 1, 1975 Population	Area Mi^2	Population Density (persons/Mi^2)
Schuyler Co.			
Dix Town	4,375	38	115
Orange Town	1,214	55	22
Chemung Co.			
Catlin Town	2,548	38.1	67
Steuben Co.			
Hornby Town	1,558	41	38

Table 15

Employment Patterns For Chemung Subarea[9]

Industry	No. Of Employees	Percent Of Total
Agricultural Services, Forestry Fisheries	20 - 99	.06 - .32
Mining	0 - 19	0 - .06
Contract Construction	1,143	3.7
Manufacturing	13,204	42.8
Transportation and Other Public Utilities	1,479	4.8
Wholesale Trade	2,059	6.7
Retail Trade	5,921	19.2
Finance, Insurance and Real Estate	1,176	3.8
Services	5,802	18.8
Non-classifiable	66	.2

Median family income	$ 9,376
Mean family income	$10,270
Percentage of families with income below poverty level	8.7
Percentage of families with income of $15,000 or more	16.5
Per capita income	$ 2,851

6.3 Land Use

6.3.1 Recreational, Natural, Archaeological, and Historical Areas

The land within the Beaver Dams area includes a portion of Coon Hollow State Forest. Two other state forest areas extend intermittently to the northwest toward Study Area I.

There are no state parks or campsites within the area, though Watkins Glen State Park lies about 6 miles northeast of Beaver Dams. The Watkins Glen Race Course is less than 2 miles from the area's northeastern boundary. This facility is an important recreational area, attracting over 100,000 persons to many events each year.

There are no wildlife management areas within a 5-mile radius of Beaver Dams.

No historic sites listed in the National Register are within the study area. The nearest site is in Watkins Glen.[12]

Detailed information on the viability of agricultural land would be required in any subsequent study of the subarea.

6.3.2 Potentially Interactive Uses

The nearest public airport is in Montour Falls to the northeast of the subarea. There is also a small private airport about 7 miles southeast of Beaver Dams.[13] There are no nuclear power plants within the study area. The nearest is the Robert E. Ginna Plant, which is about 70 miles north-northwest of the study area. Adjacent interactive uses are described in Sections 4 and 5.

6.4 Transportation Systems

6.4.1 Highways

The area is traversed by State Route 414, which connects to the Southern Tier Expressway in Corning. A secondary road also bisects the area in a north-south direction, linking Route 414 with Route 349.

Navigable Waterways

There are no commercially navigable waterways in the study area. The nearest such waterway is the southern tip of Seneca Lake at Watkins Glen, which connects to the New York State Barge Canal through the Cayuga and Seneca Canal. There has been no commercial tonnage on this waterway since 1977.

Major Ports

There are no major ports in the study area.

6.4.2 Railroads

A rail line operated by Conrail traverses the study area parallel to State Route 414. This line connects Corning, south of the study area, with Geneva at the head of Seneca Lake and with the main east-west rail line at Lyons.

6.5 Surface and Groundwater Resources

Most of the beaver Dams Area is in Schuyler County, New York. The north-eastern portion of this area is drained by tributaries of Catharine Creek, which empties into Seneca Lake. The southwestern portion of this area belongs to the watershed of Meads Creek which flows into the Cohocton River. Average ground-water productivity (1 to 100 GPM), in this area comes from sand and gravel aquifers interbedded with silt and clay or till. Thin, saturated layers of moderately permeable material occur at random in the aquifer. The average surface and subsurface water uses in Schuyler County, where the Beaver Dams Area is located, are 0.7 and 2.1 MGD, respectively.

6.6 Preliminary Environmental Assessment

Figure 37 is a composite representation of the supplemental environmental data assembled for the Beaver Dams Subarea. The small area located in Chemung and Schuyler Counties has no urban places or population centers in the area. A portion of the subarea is state forest land, and an important recreational area (race course) is located less than two miles from the area's northeastern boundary. There are no historic sites in the area. A state highway and parallel railline provide transportation access.

Surface- and ground-water features appear similar to those of New York Study Area 7.

A preliminary environmental evaluation indicates that the subarea is suitable for further exploration in the next phase of the program.

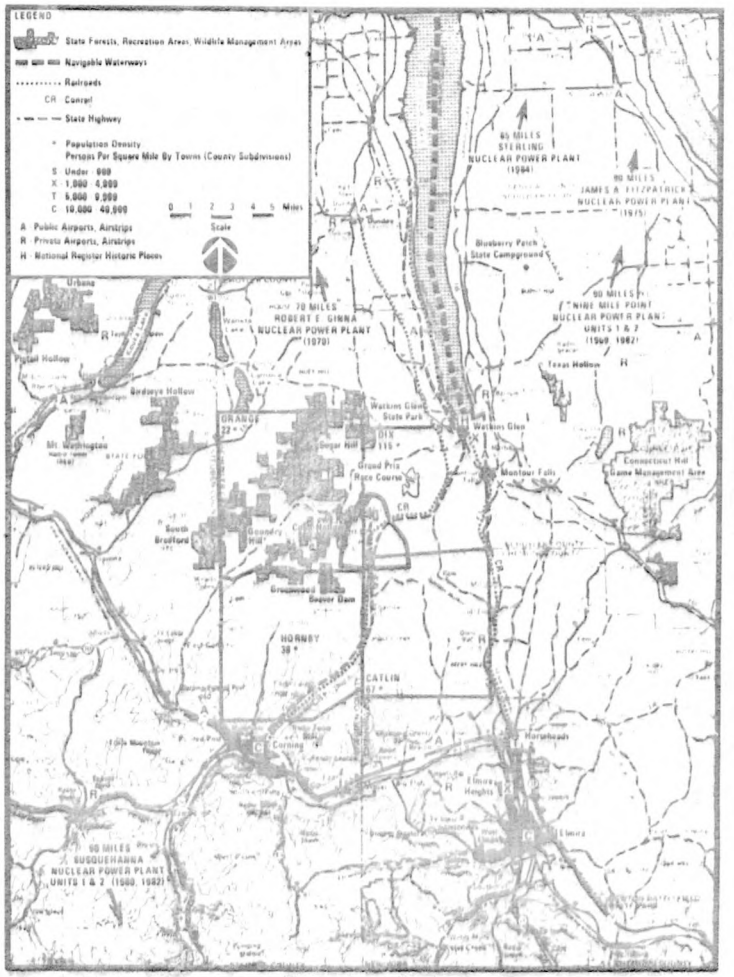


FIGURE 37 BEAVER DAMS SUBAREA COMPOSITE

7. LIST OF REFERENCES

1. R. L. Bradshaw and W. C. McClain, Eds., Project Salt Vault: A Demonstration of the Disposal of High-Activity Solidified Wastes in Underground Salt Mines, Oak Ridge National Laboratory, ORNL-4555, April 1971.

2. NUS Corporation, Plans for Environmental Surveys of Bedded Salt Formations and Overlying Areas of the Salina Basin in New York, Vol.I, Y.OWI/SUB-77/16540/2, June 1978.

3. NUS Corporation, Plans for Environmental Surveys of Bedded Salt Formations and Overlying Areas of the Salina Basin in Ohio, Vol. I, Y/OWI/SUB-77/16340/3, June 1978.

4. ONWI-16, Environmental Characterization of Bedded Salt Formations and Overlying Areas of the Salina Basin, September 1979.

5. Stone & Webster Engineering Corporation, Regional Geology of the Salina Basin, ONWI/SUB-E512-00600/1; Vol. I, October 1978.

6. Stone & Webster Engineering Corporation, New York and Ohio, Geology of Bedded Salt and Program Plan, ONWI/SUB-E512-00600/1; Vol. II, October 1978.

7. U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population: 1970 Number of Inhabitants, Final Report, PC(1)-A37, Ohio, PC(1)-A34, New York, U.S. Government Printing Office, Washington, D.C., 1971.

8. U.S. Department of Commerce, Bureau of the Census, Current Population Reports: Population Estimates and Projections, Series P-25, Number 683, Ohio, Number 680, New York, May 1977, Table 1.

9. U.S. Department of Commerce, Bureau of the Census, 1975 County Business Patterns, CBP-75-37, Ohio, CBP-75-34, New York, September 1977, Table 2.

10. Ohio Department of Natural Resources, Division of Parks and Recreation, Ohio State Parks (Map), PR-A-1, January 1977.

11. Eastern Campground and Trailer Park Guide, Rand McNally and Company, Chicago, Illinois, Summer 1978.

12. The National Register of Historic Places, National Park Service, Department of the Interior, Washington, D.C., February 1978.

13. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey, Detroit Sectional Aeronautical Chart, New York Sectional Aeronautical Chart, Washington, D.C., 1978.

14. New York State, Department of Commerce, Profile of People, Jobs and Housing, Business Fact Book, Part 2, 1974.

15. U.S. Department of Commerce, Bureau of the Census, General Social and Economic Characteristics, PC(1)-C34, New York.

16. State of New York, Department of Environmental Conservation, State Forest and Wildlife Management Area Maps.

THIS PAGE

INTENTIONALLY

LEFT BLANK